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An Exploratory Analysis of the Determinant Variables Influencing Successful Implementation of a Four-Day Workweek.

Kenneth Mark Weaver

Louisiana State University and Agricultural & Mechanical College

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AN EXPLORATORY ANALYSIS OF THE DETERMINANT
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AN EXPLORATORY ANALYSIS OF THE
DETERMINANT VARIABLES INFLUENCING
SUCCESSFUL IMPLEMENTATION OF
A FOUR-DAY WORKWEEK

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Management

by
Kenneth Mark Weaver
B.S., Louisiana State University, 1968
May, 1974

EXAMINATION AND THESIS REPORT

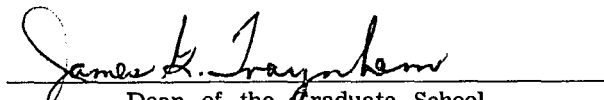
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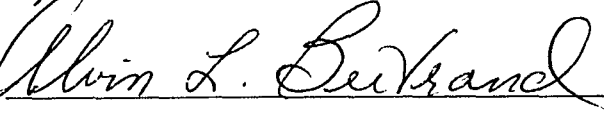
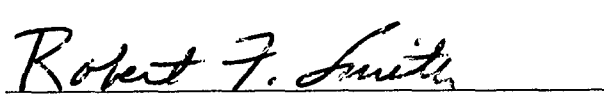
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ABSTRACT

The major purpose of this study was to investigate empirically the attitudes of top management officials toward the factors relating to successful implementation of a four-day workweek. All firms without one year's operating experience on a four-day plan were excluded from the study since their opinions would lend little to the assessment of factors influencing implementation of such a plan. Due to the limitation of attitudinal research, two separate scales of measurement were used to differentiate between agreement and impact on successful implementation of the four-day schedule. Twenty-two variables were identified for use in a comparative analysis hypothesis testing and development of a series of step-wise regression equations. The compilation of the data in these three methods extended the literature in the field and for the first time developed quantitative expressions of relationship in this area.

An extensive search for firms with operating experience was undertaken to accomplish the above purpose. Four-hundred firms within the estimated 700 firms with operating experience as of February, 1972, were chosen for the sample. The questionnaire used to gather the data consisted of 20 profiled determinants and 22 attitudinal statements. These were developed from the literature and through interviews with company officials. The variables were compared to previous

research to develop profile characteristics. Thirteen hypotheses were developed to test the data received. These were analyzed by use of a one-way analysis of variance technique. The equation development was accomplished through use of the step-wise regression technique.

In the profile development, 11 of the 20 factors were compared to previous work. The remaining nine were not considered in prior efforts and were considered extensions of the literature. The hypothesis testing resulted in four hypotheses being supported at the .05 level. Four factors had a significant impact on the successful implementation of the four-day plan. These factors were productivity, job satisfaction, labor intensiveness, and the emergence of a 'novelty' effect. The remaining variables, rate of absenteeism, presence of a union, fatigue, scheduling, age of workforce, size of firm, availability of labor, percentage of females employed, and turnover rate, did not meet the test of significance. The final section developed the following four independent equations for decision making purposes.

$$Y_A = 2.0896 - .2548X_T + .3023X_P + .1688X_{AL} + \text{Error}$$

$$Y_T = .8531 - .4150X_A + .2536X_P + .1652X_{OR} + \text{Error}$$

$$Y_P = .1785 - .3044X_A + .2808X_J + .1819X_{PE} - .1566X_T + \text{Error}$$

$$Y_S = 3.8072 + .2799X_P + .2996X_{MS} + .2278X_F + \text{Error}$$

The applicability of the equations appears to be limited at this time since the degree of interdependence is high. Refinement is possible in future research. The use of the three techniques of analysis provided a firm an adequate base for considering the variables influencing successful implementation of the four-day workweek.

ACKNOWLEDGEMENTS

I wish to acknowledge my deep sense of appreciation to my advisor, Professor Leon C. Megginson, and the members of my review committee, Dr. F. Marion Fletcher, Dr. Michael H. Peters, Dr. Robert F. Smith and Dr. Alvin O. Bertrand, for their time and critical assessments of the research.

I also wish to thank Professor David Smith for his extensive assistance in preparing the statistical tools utilized in the dissertation.

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CHAPTER I

INTRODUCTION

The idea of a shortened workweek is not an invention of the 1970's. Walter Reuther bargained for a four-day, 32 hour week in the 1950's. Rudolph Corvini states the four-day week has been in effect nearly 30 years for certain truck drivers.¹ Yet it is only since 1970 that the current rapid increase in interest within both the public and private sectors toward the idea of a shortened workweek has emerged. The most common approach has been the introduction of a four-day workweek while maintaining the traditional standard 40 hours of work. Other firms have adopted schedules which slightly reduce the total weekly hours of work and/or the number of days worked to less than four full days.² Eileen Hoffman suggests three current variations of the four-day theme:

¹Letter from Mr. Rudolph Corvini, Manager, Employee Relations Research Planning, Mobil Oil Corporation, May 3, 1973.

²Riva Poor (ed.), 4 Days, 40 Hours: Reporting a Revolution in Work and Leisure, with a Foreword by Paul A. Samuelson (Cambridge, Mass.: Bursk & Poor Publishing, 1970), p. 28.

The compressed workweek describing a shorter workweek with the same number of hours.

The reduced workweek provides for a slight decrease in total weekly hours but still calls for longer days.

The "less work" week is a shorter week with the standard 7- or 8-hour day preserved.

Flexibility appears to be a key factor in determining each firm's schedule. It should be recognized, however, that the four-day workweek concept predominates and is cited extensively. For this reason, the present study utilizes the American Management Association's definition of the four-day week as "any arrangement of work days and hours scheduled by an organization whereby one or more groups of employees fulfill the work commitment in fewer than the standard five full days."⁴ It should be emphasized that this definition is not the same as the concept of "flexible working hours" which Gordon and Elbing described as a "system whereby individual workers can come and go at their pleasure, within certain limits, so long as they work a prescribed number of hours each week."⁵ Because of the possible variations from the four-day definition used in this study, therefore, this definition was omitted.

³Eileen B. Hoffman, "The 4-Day Week Raises New Problems," The Conference Board Record, Vol. 9, No.2 (February, 1972), p. 21.

⁴Kenneth E. Wheeler, Richard Gurman, and Dale Tarnowieski, The Four-Day Week: An AMA Research Report, Report to General Management Division of the AMA (n.p.: American Management Association, Inc., 1972), p. 2.

⁵John R. M. Gordon and A. O. Elbing, "The Flexible Hours Work Week--European Trend is Growing," The Business Quarterly (Winter, 1971), p. 67.

Paul A. Samuelson suggests that the four-day workweek is a "momentous social invention."⁶ One of the primary reasons for such a statement appears to be the increasing number of alternatives to a standard workweek which become available to the worker. It appears, then, that the idea of alternatives may be more vital to the "momentous" nature of the four-day workweek than the specifics of any one plan. Therefore, this research is designed to determine what factors managers perceive as critical to their firm's success or failure in adopting a four-day workweek.

Purpose of Study

Reporting and opinionated types of information concerning the flexible workweek are found in articles and speeches in nearly every conceivable source. Many of the recent efforts are extremely limited and lack adequate research bases. Only limited attempts have been made to investigate the underlying variables related to success. For example, Samuelson's suggestion that the four-day week is "a momentous social invention" came at a time when only 27 small, non-union firms were being studied.

The first major purpose of this study is to investigate empirically the attitudes of top management officials toward the factors relating to successful implementation of their chosen workweek arrangement. A number of factors are utilized in order to investigate the determinants of successful implementation. These are

⁶Paul A. Samuelson, "Foreword" in Poor, op. cit., p. 7.

discussed in the methodology section of this study.

To provide an adequate research base for analysis, a second major purpose of this research is to develop profiles and reporting data on firms operating on a flexible workweek, and also to test hypotheses and develop a set of equations to predict the impact on success of selected variables. This should increase the applicability of the findings and produce tangible evidence of factors related to success.

Scope of Study

The research excludes all firms not operating on a four-day workweek as defined by this research. Also excluded are firms who presently are only considering adoption of a four-day workweek. Although this group has been included in research such as that done by the American Management Association, these firms have had no real experience with the new workweek. This experience is considered critical to the assessment of factors affecting the implementation success or failure.

Also excluded are firms who were determined to have adopted a flexible workweek after February, 1972. This exclusion insures that all respondents have had at least one year's experience since adoption of the new schedule. In order to approach the best fit of the sample to the population, no limitations are placed on the size or type of enterprise included in the study. Further, no geographic limitations are imposed as the sample was nationally distributed.

General employee attitudes are excluded from the study. Only the perceptions of top management officials associated with the implementation of the flexible workweek have been collected. This has been done to determine the extent of impact on success of each of the independent variables used in the study. Top management officials should be most familiar with problems of implementation and evaluation.

Justification of Study

Dawe states that "research falls short of its mark if it involves mere gathering and tabulation of data. There must be a search for meaning and an examination of the cause and effect relationship."⁷ Based on this, it appears the prior research on the flexible workweek has been highly exploratory and does not meet descriptive cause and effect criteria. Therefore, the testing of hypotheses and the development of predictive equations of success are valid reasons to conduct the research.

These reasons point up the significance of a research effort and indicate that it has the capability to fill gaps in our knowledge concerning the factors underlying successful implementation of the flexible workweek.

⁷J. Dawe, Writing Business and Economic Papers (Totowa, N.J.: Littlefield, Adams, Co., 1965), p. 11.

Limitations of the Study

As noted earlier, this is basically an attitudinal study. Thurstone suggests that one can use an attitude scale if it can reasonably be expected that the respondents will answer truthfully. It is assumed that the persons sampled are professional enough to appreciate the reason and value of the research and answer all inquiries as truthfully as possible. They may not, however, have complete knowledge of the situation. Distortion may also occur to disguise problems in a given firm. Another factor increasing validity is the apparent desire for information expressed by the respondents.

One problem area is that of measurement. Survey research is subject to errors of measurement involved in attempting to determine a scale value or score representing individual attitudes or perceptions.⁹

General methodological problems in a survey study of this type also constitute limitations. Some of the most significant problems are:

1. Proper formulation of statements
2. Differences in conditions under which the instrument is administered
3. Difficulty in obtaining an adequate estimate of the population
4. Differences in persons who fill out and return the questionnaire and those who do not.¹⁰

⁹Leon Festinger and Daniel Katz (eds.), Research Efforts in the Behavioral Science (New York: Ogden Press, 1953), pp. 48-51

¹⁰Anne Anastasi, Psychological Testing (New York: Macmillan Co., 1961), p. 546.

Procedures have been followed to minimize the effect of these problems. The statements used in the questionnaire have been developed from among statements made by writers, operation managers, and the author's knowledge of the four-day workweek. The only control over the way persons answer the questionnaire is that returns which do not follow the directions provided on the questionnaire are eliminated. With respect to the third limitation, a reasonable estimate of the population is available. Chapter III shows how this estimate is derived. No control for differences in persons who filled out and returned the questionnaire and those who did not is utilized. This could bias the results by reporting only the most successful firms.

Another limitation is the inability to determine fully an individual respondent's knowledge of the actual operation of the plan in the organization. This is reduced somewhat by the selection of firms with a minimum of one year's experience on a flexible plan.

Research Design

This research has been undertaken to utilize the information available at the current time in developing an appreciation of the impact selected variables would have on a firm's implementation of a four-day workweek. This section first discusses the method of determining which variables to include in the current study. Secondly, the techniques used to collect and analyze data is discussed.

Determination of Variables

Seemingly endless lists of variables have been discussed as affecting the degree of success achieved in the implementation of a four-day workweek. As previously noted, direct measures of operative employee attitudes are excluded from the study. This reduces the list considerably and leads to the inclusion of the variables shown in Exhibits 1.1 and 1.2

The lists of variables in Exhibit 1.1 is used to develop profiles of responding firms for comparison to the samples utilized in prior studies. The profile characteristics are also used in the hypothesis testing reported in Chapter V.

EXHIBIT 1.1

Variables Considered in Development of Profiles

Adoption date of plan	Availability of labor prior
Size of firm	to conversion
Type of industry	Changes in total wage bill
Union status of participants	Number of shifts
under flexible workweek	Length of the work day
Labor intensive vs. capital	Moonlighting by employees
intensive	Number of other firms in
Average percentage of sales	area on flexible workweek
to government contracts	Economic outlook at time of
Size of workforce affected	conversion
Age of workforce affected	Overall management
Skill levels of employees	satisfaction
affected	

Exhibit 1.2 presents 22 factors which were identified as independent variables in order to develop hypotheses and equations to determine which of the variables were related to success.

EXHIBIT 1.2

Listing of Selected Independent Variables

Management commitment	Skill level of employees
Innovative experience	Availability of labor
Novelty	Fatigue
Prior job dissatisfaction	Absenteeism
Job commitment	Necessity of overtime payment
Size of firm	Demand for wages
Union status	Turnover rates
Degree of labor intensiveness	Productivity
Percentage of female employees	Complexity of managerial tasks
Average age of employees	Scheduling
Prior planning	Employee satisfaction

The variables in Exhibit 1.2 are utilized in an attempt to explain the reasons for successful implementation of the flexible workweek. The variables selected have been chosen for one of two reasons. A number of individual firms reporting their experiences on the flexible workweek suggest that these factors have affected their success. Second, additional variables have been added which intuitively appear to be critical.

These variables were utilized for hypothesis testing in those instances where it appeared appropriate and as inputs to the regression model to determine which of the selected independent variables produced the optimum regression equation.

The hypotheses tested are discussed in Chapter III. The remainder of the variables are considered to be exploratory in nature since adequate sources of information concerning their impact

on success is not available. The stepwise regression equations are used to examine both the variables being considered in this study.

The dependent variable is success of implementation of a flexible workweek as perceived by the respondents. The following variables are used as surrogate criteria for "success of implementation of a flexible workweek" -- turnover rate, absenteeism rate, productivity, and employee satisfaction -- in the development of the predictive equations. These measures are cited because they are mentioned in a number of current articles. All four have been cited in the reports by Poor,¹¹ Hedges,¹² and the American Management Association.¹³

Turnover rate is utilized because of prior descriptive and exploratory study results. Turnover has declined in a majority of the firms questioned which suggest benefits from the four-day workweek.

A decline in absenteeism has also been previously suggested as one positive result of a four-day conversion. Reports indicate that this is an important factor since one day's loss of pay is now greater.

Productivity may be the most discussed of the four measures. Each of the reports cited above reports a preponderance of positive response concerning productivity, but fails to differentiate between

¹¹Poor, op. cit., pp. 27-28.

¹²Janice Hedges, "A Look at the 4-Day Workweek," Monthly Labor Review, Vol. 94, No. 10 (October, 1971), p. 33.

¹³Wheeler, Gurman, and Tarnowieski, Op. cit., pp. 4-5.

individual responses. The use of only aggregate figures has limited the development of specific equations or predictors for different types of industries and firms.

Employee satisfaction may be one of the reasons for positive results in the above areas. A report by Dr. Thomas Vris of Equitable Life Insurance Society suggests that "in order to put technical knowledge to work, management will become increasingly sensitive to the psychological and social needs of individuals."¹⁴ He offers the flexible workweek as one approach to accomplish this end.

These variables were measured by using the respondent's perceived impact on success in the statements representing each variable.

Techniques of Data Collection and Analysis

This research focuses on the estimated 700 firms with operating experience on a four-day workweek as of February, 1972. Four hundred firms (400) within the population were available for this research. The selection of firms is discussed in Chapter III.

A two-part questionnaire (see Appendix 1) was mailed to the 400 firms selected for the research. Part I consists of 20 profile characteristics and four questions utilizing prior/since conversion measures of success. The second part of the questionnaire consists of 22 statements developed from a review of the literature. Two attitude scales follow each statement in order to determine:

(a) management attitudes toward the variable represented

¹⁴Dr. Thomas Vris, "New Workweek Schedules: Some Implications for Management," speech delivered to the Conference on 4-Day Workweek, University of Pittsburg, November 4, 1971.

by the statement; and (b) the impact of that variable on success of the conversion to a four-day week. Two scales are used to differentiate between individual's opinions and his firm's experience with the four-day plan. It is also felt that the second scale will be more useful than individual opinions only.

The data collection procedures are designed to increase the response rate and provide useful data for analysis. The questionnaires were printed and mailed to each firm with instructions on the proper way to respond to the questions and to return the instrument in the postage-paid envelope provided.

After all usable replies are tabulated and transferred to IBM cards, the statistical analysis of the data was undertaken. The hypotheses are tested by use of a one-way analysis of variance to determine significance at the .05 level. The second portion of the data analysis utilizes a stepwise regression technique to determine the best equation to predict the impact on success of each of the variables under study. The techniques utilized for the analysis are explained more fully in Chapter III.

Preview of the Organizational Plan

This research is partially based on a review of the current literature. Chapter II develops the literature pertaining to empirically-based research and nonempirical efforts, with an addendum discussing literature subsequent to the current research. Within each section, a chronological order is utilized to present the literature.

Chapter II provides the basis for development of the statements utilized in the questionnaire and in development of the hypotheses presented in Chapter III.

Chapter III presents the methodology employed in the present study. The development of justification of the hypotheses is discussed in the first part of the chapter. The methods of selecting the sample firms surveyed is then discussed. The development of the questionnaire is presented in the third section. Section four is a discussion of the procedures used in the collection of data. The final section presents a description of the techniques of data analysis employed.

Chapters IV, V and VI present the results and analysis of the study in three sections. Chapter IV is a comparison of the profile characteristics of the responding firms with the results of two prior research efforts. Hypothesis testing is discussed in Chapter V. The final section, Chapter VI, presents the series of equations developed through a step-wise regression analysis.

The final chapter presents conclusions and implications for future research.

CHAPTER II

REVIEW OF LITERATURE

The literature on the four-day workweek has grown at an increasing rate since the popular introduction of the topic by Riva Poor in 1970.¹ Despite an apparent abundance of information which followed Poor's book of readings, the current literature is primarily exploratory in nature.

This chapter traces the development of the pertinent literature available at this time. The first section discusses empirical research efforts, and the significance of numerous nonempirical and descriptive efforts. Each section develops the topic chronologically. This is done in an attempt to trace additions to the scope of knowledge concerning the four-day workweek which were applicable to the development of hypotheses and equations. The second section discusses developments in the literature subsequent to the current research.

¹Riva Poor(ed.), 4 Days, 40 Hours: Reporting a Revolution in Work and Leisure, with a Foreword by Paul A. Samuelson (Cambridge, Mass.: Bursk & Poor Publishing, 1970).

Literature Relating to Hypothesis Development

The purpose of this section is to examine both the empirically based reports concerning four-day workweek conversions and the numerous nonempirical and descriptive efforts.

Poor: 4 Days, 40 Hours: Reporting a Revolution in Work and Leisure

The first significant attempt to explain the basis of a four-day workweek was written by Riva Poor in 1970. The stated purpose of the book was to provide "useful information about this innovation while the information is still useful."² In this context, the research is successful and encourages the rapid increase in interest in the phenomenon. Of particular significance for those who read the book is the fact that it introduces variations of the workweek which are largely unknown to many businessmen and academicians.

In Poor's lead article, she asks the question, "What's in this book?" She proceeds to answer the question by asking, "Who's doing it? Why? How? With what advantages? What disadvantages? And where might it lead us?"³ The answers to these questions are provided by 13 articles discussing individual firms' experiences, variations in plans, legal restrictions, the reactions of organized labor, scheduling problems, interface with external forces, programs

²Ibid., p. 3.

³Ibid., p. 20.

for implementation, employee reactions, and other miscellaneous topics. The primary importance of the book for this research, however, is the empirical study of 27 four-day firms. This provides a portion of the sample of firms considered in the current research effort. While Poor's sample is rather small, the reported results regarding increases in productivity, lower absenteeism, lower turnover, high morale, and recruitment advantages are similar to those studies with much larger samples conducted by both the American Management Association effort and that conducted by the Bureau of National Affairs in connection with the American Society for Personnel Administration.

Wheeler, Gurman, and Tarnowieski:
The Four-Day Week: An AMA Research Report⁴

The American Management Association (AMA) study was conducted in mid-1971 and published in 1972. It was written by Kenneth E. Wheeler, a management consultant specializing in the four-day work-week, and by Richard Gurman and Dale Tarnowieski, research associates for the AMA. One thousand fifty-six (1,056) firms and organizations responded to their questionnaire, of which 143 had a four-day week plan in operation and 237 were evaluating the possibility of a four-day week. The major conclusions of their research are noted below:

⁴Kenneth E. Wheeler, Richard Gurman, and Dale Tarnowieski, The Four-Day Week: An AMA Research Report, Report to General Management Division of the AMA (n.p.: American Management Association, Inc., 1972).

Most businessmen not currently considering installation of a four-day week believe that costs would definitely increase under such a plan. However, only 11 percent of the four-day companies responding to the survey actually experienced higher costs; 38 percent reported an overall decrease in operating expense.

Production was increased in 62 percent of the 143 four-day companies, and declined in only 3 percent. Scheduling, however, remains an important problem in about one out of four short-week companies.

Efficiency increased in 66 percent of the four-day companies reporting; only 3 percent report a decrease. In contrast, five-day-week respondents believe that employee efficiency will be reduced on a four-day week where daily hours of work increase.

Profits increased for 51 percent of the four-day companies reporting. Only 4 percent reported a decrease.

Both four-day and five-day respondents believe that union leaders will view the four-day week as representing progress toward a four-day, 32-hour week for labor. Many labor leaders disagree.

Most five-day respondents believe fatigue will increase if a longer day is worked. Most four-day spokesmen disagree.

Many observers estimate the rate of failure for the four-day week at 10 to 15 percent. In the AMA survey, however, a failure rate of 8 percent was detected.⁵

The study was primarily a study of four-day firms, but as noted in Chapter I, the definition was broad enough to include the seven three-day firms and 10 four-and-a-half-day firms responding. Also noted was the fact that approximately 30 percent of the four-day firms worked either more or less than 40 hours. This indicates

⁵Ibid., pp. 4-5.

"4-40" is not the only alternative and firms tend to adopt the combination of days and hours best suited to their operation. Exhibit 2.1 shows the primary advantages and disadvantages of a four-day week according to four-day week companies.

Advantages and disadvantages have also been discussed in a non-empirical manner by writers in this area. These articles are also reviewed in this chapter. Overall, the AMA report added to the available knowledge by use of a larger sample of firms and expands Poor's earlier work.

EXHIBIT 2.1

Principal Advantages and Disadvantages of a Four-day Week

<u>Advantages</u>	<u>Disadvantages</u>
Increased employee morale	More involved scheduling
Additional employee benefits	Problems with working mothers
Reduced absenteeism	Fatigue
Better recruitment opportunity	Employees' dislike of working overtime
Increased productivity	Resentment from employees not on four-day week
Better equipment utilization	Inadequate supervision
Better customer service	Absenteeism
Increased production	Cost increases
Increased employee efficiency	Shipping problems
Greater production scheduling flexibility	Personnel administration difficulties
Increased management morale	
Decreased costs	

SOURCE: Kenneth E. Wheeler, Richard Gurman, and Dale Tarnowieski, The Four-Day Week: An AMA Research Report, Report to General Management Division of the AMA (n.p.: American Management Association, Inc., 1972), pp. 14, 15.

Decreased overtime requirements
 Decreased employee turnover
 Fewer Start-ups and shutdowns
 Increased profits
 Increased leisure time
 Employee satisfaction with opportunity for additional moonlighting
 Improved employee discipline
 Better competitive posture

Costs on fifth day
 Overtime costs after eight hours
 More difficulties in management job
 Employees' resistance to change
 Customers' confusion about new business hours
 Tardiness
 Increased moonlighting
 Possibility that 4-day, 40-hour week may lead to union demand for 4-day, 34-hour week

ASPA-BNA: ASPA-BNA Survey:
The Changing Workweek⁶

In January, 1972, the Bureau of National Affairs, Inc., in cooperation with the American Society for Personnel Administration, undertook an effort to discover personnel executives' attitudes toward experiments with the new workweek. Highlights of their survey, based on a sample of 71 companies that had reported new workweek policies, are reported below:⁷

The firms involved in changing the workweek are too few to predict a trend toward the change.

A change in the workweek is difficult for large companies to accomplish (83% have been small firms).

In 73% of the cases impetus for making the change came from among management officials.

Eighty-two percent of the firms were non-union.

Seventy-nine percent of the firms were satisfied with the change.

A large percentage considered the change permanent (73%).

⁶American Society for Personnel Administration (ASPA)-Bureau of National Affairs, Inc. (BNA), "ASPA-BNA Survey: The Changing Workweek," Bulletin to Management (January 6, 1972).

⁷Ibid., p. 1.

Additional findings of interest indicate that approximately 89 percent of the firms surveyed accomplished the goals which management had in mind at the time of the conversion.⁸ The high success ratio is similar to the results of the Poor and AMA studies. The study also uses some open-ended questions to determine advantages and disadvantages of the four-day schedules. The responses were extremely varied and pointed up the need for more research to determine the results of changing the workweek in various organizations.

The remainder of the literature is primarily non-empirical and is discussed next.

Non-Empirical Sources

The literature concerning the flexible workweek is recent by most standards. The earliest significant non-empirical works concerning a shortened workweek appeared in 1971. Since that time, a large number of articles have appeared expressing one view or another. This section discussed the articles published in 1971 and 1972.

1971: Selected Works Concerning the Four-Day Workweek

Four articles are reviewed from those that appeared in 1971. The first article, "Social Innovation: 4 Days-40 Hours," by Riva Poor,⁹

⁸Ibid.,p. 3.

⁹Riva Poor, "Social Innovation: 4 Days-40 Hours," Columbia Journal of World Business, Vol. 6, No. 1 (January-February, 1971), pp. 91-92.

was adapted from the first chapter of the book cited earlier.

Second, an opinion polling of Dun's Presidents' Panel¹⁰ is considered. The third source considers a report by Herbert R. Northrup which was presented at a conference on productivity in September, 1971.¹¹ The final article, written by Janice Hedges, is an overview of the state of the four-day workweek that was published in October, 1971.¹²

All of these articles ask the following question: Will the flexible workweek accomplish anything for the firm? Each article proposes advantages and disadvantages to answer this question.

Poor: "Social Innovation: 4 Days-40 Hours."¹³ As noted previously, Riva Poor appears to have initiated the current rise in interest in the shortened workweek. One reason she cited for experimenting with the four-day, forty-hour alternative is to "enhance company profits and employees' lives."¹⁴

The area of labor relations is the one most often cited as improving after implementation of the new workweek.¹⁵ Incentive,

¹⁰Neil A. Martin, "Can the 4-Day Week Work?," Dun's Review, Vol. 98, No. 1, (July, 1971), pp. 39-45.

¹¹Herbert R. Northrup, "Reflections on the Ten-Hour Day, Four-Day Week," speech reported in Daily Labor Report, No. 144 (July 27, 1971).

¹²Janice Hedges, "A Look at the 4-Day Workweek," Monthly Labor Review, Vol. 94, No. 10 (October, 1971), pp. 33-37.

¹³Poor, loc. cit.

¹⁴Ibid.

¹⁵Ibid., p. 93.

morale, or better living conditions are frequently cited as areas of improvement. Poor suggests that 'most firms have concluded that the difficulties of implementing the systems are outweighed by the long-range advantages and would do it all over again."¹⁶

Martin: "Can the 4-Day Week Work Now?"¹⁷ A different view is expressed by Neil Martin and the executives of Dun's Presidents' Panel. Their evaluation of the four-day week is based on opinions of the 300 corporate presidents and chairmen who serve on the Presidents' Panel.

They express caution and consider the limited nature of adoption. A common question is whether conversion could work in large, capital-intensive manufacturing companies. Increased productivity was cited by Poor in the original work, but, according to Dun's panelists, "increased productivity is doubtful at best."¹⁸ Rodney Gott of AMF, Inc. states, "I do not believe that lower productivity on Friday will be eliminated. It will simply move to Thursday."¹⁹ Fatigue is also extensively discussed by the panelists.

William F. May of American Can Company is one of the panelists who felt fatigue would not be increased "when the work is challenging and not repetitive."²⁰ Others felt fatigue is a critical factor for

¹⁶Ibid., p. 95.

¹⁷Martin, loc.cit.

¹⁸Ibid., p. 40.

¹⁹Ibid.

²⁰Ibid.

many jobs and should be considered carefully.

Other problems discussed are increased difficulty in union-management bargaining, moonlighting, and problems in employee time utilization.²¹ Concerning the impact on the economy, they suggest possible inflationary pressures, decreased job opportunities for some sections of the labor force, and a further weakening of the United States' ability to compete in world markets if productivity declines as they anticipate.²²

Their closing suggestion is to "look before we leap into a blanket endorsement and adoption of the four-day week for all American industry."²³

Northrup: "Reflections on the Ten-Hour Day, Four-Day Week"²⁴
Herbert R. Northrup's remarks appeared to take a less negative view of the four-day week than does Dun's Panel. According to Northrup, the circumstances which might promote the shorter workweek include the following:

1. Increased difficulty of getting to work.
2. Increasing number of those in the labor force seeking part-time work.
3. Increasing proportion of women in the labor force.
4. Changing attitude toward work.

²¹Ibid., p. 45.

²²Ibid.

²³Ibid.

²⁴Northrup, op. cit., p. 1.

He also suggests reasons why a rearranged workweek will experience difficulty. These include:

1. Legal constraints either forbid or complicate the 10-hour day.
2. Unions are reluctant to give up provisions requiring overtime, and are not sufficiently certain of members' desires to articulate the 4-day week as a union demand.
3. In many instances, the 4-day week would require a fundamental change in the way of life of workers and their families.
4. Management interest in the 4-day week is based upon quite different priorities and expectations than that of unions.
5. The idea that the 4-day week will enhance productivity is by no means proved. On the other hand, it does require certain costs.
6. Income rather than leisure shall dominate utility choice.²⁵

Another point made by Northrup is that a four-day workweek doesn't always mean a three-day weekend as Poor implied in her earlier works. This may reduce the employees' acceptance in some instances. A concluding comment points up a concern similar to Dun's panel that "by its emphasis on leisure, instead of work, it is likely to point in a direction not particularly helpful to an economy beset by persistent inflation and high costs in the international market place."²⁶

²⁵Ibid.

²⁶Ibid., p. 4.

Hedges: "A Look at the 4-Day Workweek."²⁷ The final article from 1971 to be discussed is a review of the four-day week as it existed in late 1971.

The article presented characteristics of firms gleaned from secondary research which are similar to the previous articles. One significant finding is the "growing preference for blocks of leisure" which the four-day week could provide.²⁸ The pros and cons presented in this article are similar to the articles cited previously. Productivity increases are once again questioned in this article, but the author concludes that the question "cannot be answered definitely on the basis of available experience."²⁹

The prospects for conversion to a four-day week include the following:

1. Unlikely to dominate work schedules to the extent that the 5-day week does.
2. Impetus is for work schedules designed to fit the technological and other requirements of an individual firm and the needs and preferences of its workforce.
3. Support for the 4-day week may shift if union leaders see it as a vehicle for reducing weekly hours.
4. "Compressed" hours will probably be shorter hours as well.³⁰

²⁷Hedges, loc. cit.

²⁸Ibid., p. 33.

²⁹Ibid., p. 35.

³⁰Ibid., pp. 35-36.

This article, as well as the previous works cited, centers on the four-day week, yet their conclusions seem to be that a flexible program designed to fit the firm's needs may be what is emerging. This increased variation and willingness to experiment exists among many of the firms and individuals questioned.

The second part of this section discusses some of the issues presented in the literature in 1972. These articles are of varying quality and significance and were chosen because they represent the diversity of articles written in this area. Other articles are mentioned in Chapter III in developing the hypotheses and statements utilized in the research instrument.

1972: Selected Works Concerning the Four-Day Workweek

The 1972 articles reviewed here include several different approaches to the discussion of a flexible workweek. The articles are again arranged chronologically.

The first article by Simpson, Clayman, and Hannigan is a discussion of two views of the plan, representing labor and management responses.³¹ Murphy asks if the four-day workweek is a "palliative or panacea."³² A report by J. D. Hodgson discusses the prospects of a four-day week by 1990.³³

³¹W. Hunter Simpson, Jacob Clayman, and Thomas Hannigan, "The 4-40 Workweek: Two Views," Manpower (January, 1972), pp. 14-19.

³²Eugene Murphy, "4-Days, 40-Hours: Palliative or Panacea?," New Jersey Business (February, 1972), pp. 57-60.

³³J. D. Hodgson, "4-Day Week: How Widespread by 1990?," Commerce Today (February 7, 1972), pp. 37-40.

To be successful, Suchocki says firms need " a game plan for success."³⁴ In the final article, Don Hellriegel develops a model to assess the before and after effects of an organization's workweek conversion.³⁵

Simpson, Clayman, and Hannigan: "The 4-40 Workweek: Two Views."³⁶ This article expresses the opinions of W. Hunter Simpson, representing management's interpretations of the shorter workweek, and Jacob Clayman and Thomas Hannigan, representing the views of organized labor.

Simpson reiterates the views expressed earlier that a major goal of conversion to a flexible workweek is to "improve employees' morale, and thereby motivate them to work more efficiently."³⁷ Some of his views differ from those expressed in earlier articles. He suggests firms can make more efficient use of physical resources and, by using a staggered workweek, can "obtain 25 percent more use of its equipment during the basic workweek."³⁸ He also states that female workers have not experienced a negative reaction toward a longer workday.

Fatigue due to longer workdays is one of the most mentioned criticisms of the shorter workweek. Simpson suggests "fatigue is more related to the employee's attitudes toward his job and his working

³⁴C. J. Suchocki, "4-Day Workweek Needs Game Plan for Success," Iron Age, Vol. 209 (March, 1972), pp. 65-67.

³⁵Don Hellriegel, "The 4-Day Workweek: A Review and Assessment," MSU Business Topics, Vol. 20, No. 2 (Spring, 1972), pp. 39-48.

³⁶Simpson, Clayman, and Hannigan, loc. cit.

³⁷Ibid., p. 19.

³⁸Ibid., p. 16.

conditions than to length of hours."³⁹

In general, Simpson believes that problems may have been exaggerated and that a shorter workweek will come about in some form.

A strikingly different view is expressed by Clayman and Hannigan. Their opposition centers around the belief that "more than eight hours of work per day is harmful to the moral, social, and intellectual development of the worker, and to his economic well-being and safety."⁴⁰

If productivity does increase with a longer workday, labor wants its share expressed in overtime after eight hours. Also, the gains attributed to workers in lower transportation costs, for example, can be dismissed in Clayman and Hannigan's opinion.

Isolation from family, friends, and the outside community or union activities are projected by Clayman and Hannigan as the worker has fewer hours per day not committed to work activities.⁴¹ Another major area of concern is for health and safety problems which could be created by a longer workday. The authors suggest that "prolonged, unalleviated exposure of workers to hazardous substances, adverse temperature, limited motion, noise, and artificial light leads to increased fatigue and increased bulk of toxic substances in the body."⁴² They also cite possible physiological and mental problems due to increased mental stress produced by repetitious, monotonous work.

³⁹Ibid., p. 18.

⁴⁰Ibid., p. 14.

⁴¹Ibid., p. 15.

⁴²Ibid., p. 16.

The final point presented is that the trend to "4-40" could lead to the Fair Labor Standards Act being nullified and "a return to the old days where work schedules reflected the strength and wishes of employers alone."⁴³

The two views presented in this article illustrate the diversity of opinions concerning the four-day week.

Murphy: "4-Days, 40-Hours: Palliative or Panacea?"⁴⁴

Murphy's article presents comments by firms with experience on a rearranged workweek. Problems with unions, rates of pay, commuting schedules and fatigue are cited by the firms.

Three additional areas of interest are discussed, however. First, the voluntary nature of the change is noted and the consensus is that it would come about. Second, it is suggested that experimentation in work hours "can operate as a change agent that can carry along with it a host of other changes in work flow, standards, and management personnel shifts against which there normally would be great resistance."⁴⁵ Roy Walters questions the impact of a flexible workweek on the meaning of work itself. According to Walters, "the four-day week says in effect, you only have to spend four days doing this damn stupid job instead of five and ignores the more important factor of using people to the best of their capacity."⁴⁶

⁴³Ibid., p. 19.

⁴⁴Murphy, loc. cit.

⁴⁵Ibid.

⁴⁶Ibid., p. 60.

The reactions remain varied, but a common belief seems to exist that some form of a shorter workweek is coming.

Hodgson: "4-Day Week: How Widespread by 1990?"⁴⁷

Hodgson's article traces the historical development of the increasing hours of leisure available to the worker and indicates that this trend may be declining in favor of more "usable" leisure.⁴⁸ This is behind the movement to the three-day holiday weekend which already put workers on a four-day week for ten percent of the year.⁴⁹

After a review of the types of firms currently operating on a flexible plan, Hodgson states that, "Obviously the type of business in which one is engaged, the availability of labor and the most beneficial utilization of expensive machinery and equipment are important factors in the consideration of any arrangement of working hours."⁵⁰

Hodgson suggests that the shortening of weekly hours of labor, expansion of preference for blocks of leisure time and greater scheduling flexibility are important to the success of a rearranged workweek.⁵¹ According to Hodgson, the most important of these is the desire for "block" leisure. This implies a trade-off between real income and leisure and is a question which needs more research to accurately determine worker preferences.

⁴⁷Hodgson, loc. cit.

⁴⁸Ibid., p. 38.

⁴⁹Ibid.

⁵⁰Ibid., p. 42.

⁵¹Ibid., p. 44.

Suchocki: "4-Day Workweek Needs Game Plan for Success."⁵²

Albert Lewis states that "the lack of pure planning, more than any other factor, is behind incidences of four-day workweek failure."⁵³ This statement is among several thoughts presented in an article written by Carl J. Suchocki. Mr. Lewis has several informative opinions concerning the value of implementation of a flexible plan:

People are smarter, better educated--money has lost its glamour as a prime motivator.

It's not a panacea for employee relations. You can't just install it and expect it to cure all your ills.

Fatigue is only a problem in the first week or two.

Some companies might not be adaptable to it.

Don't look for reasons why you shouldn't go to it, but for reasons why you should.⁵⁴

These statements suggest that realism and foresight are needed to evaluate the potential for conversion.

Hellriegel: "The 4-Day Workweek: A Review and Assessment."⁵⁵

The importance of planning is further developed by Don Hellriegel. Hellriegel presents a review of the development of the changing work-week and suggests potential advantages for the firms, the worker, and for society.⁵⁶ These are not significantly different from previous

⁵²Suchocki, loc. cit.

⁵³Ibid., p. 65.

⁵⁴Ibid., pp. 66-67.

⁵⁵Hellriegel, loc. cit.

⁵⁶Ibid.

articles.

The most significant aspect of this article is his development of a descriptive model to provide an evaluation format for firms considering a four-day workweek. The model is constructed in a "building" manner. That is, the first stage must provide a satisfactory response before proceeding to the second, and the second must be satisfactory before analyzing the variables in the third stage. Exhibit 2.2 presents Hellriegel's model.

In Hellriegel's model, one limitation appears to be that a firm could reject a proposed conversion at the first stage based on negative findings which could possibly be overcome by extremely positive results in level two or three conditions. This model was the best found in the literature to date, however, for providing decision-making criteria. The consideration of the variables in each stage suggests there are factors which should be considered.

Subsequent Developments in the Literature

The articles reviewed in this section were published after the data was gathered for the current research. The purpose of including these articles is to up-date the literature and to provide more information for the analysis of data.

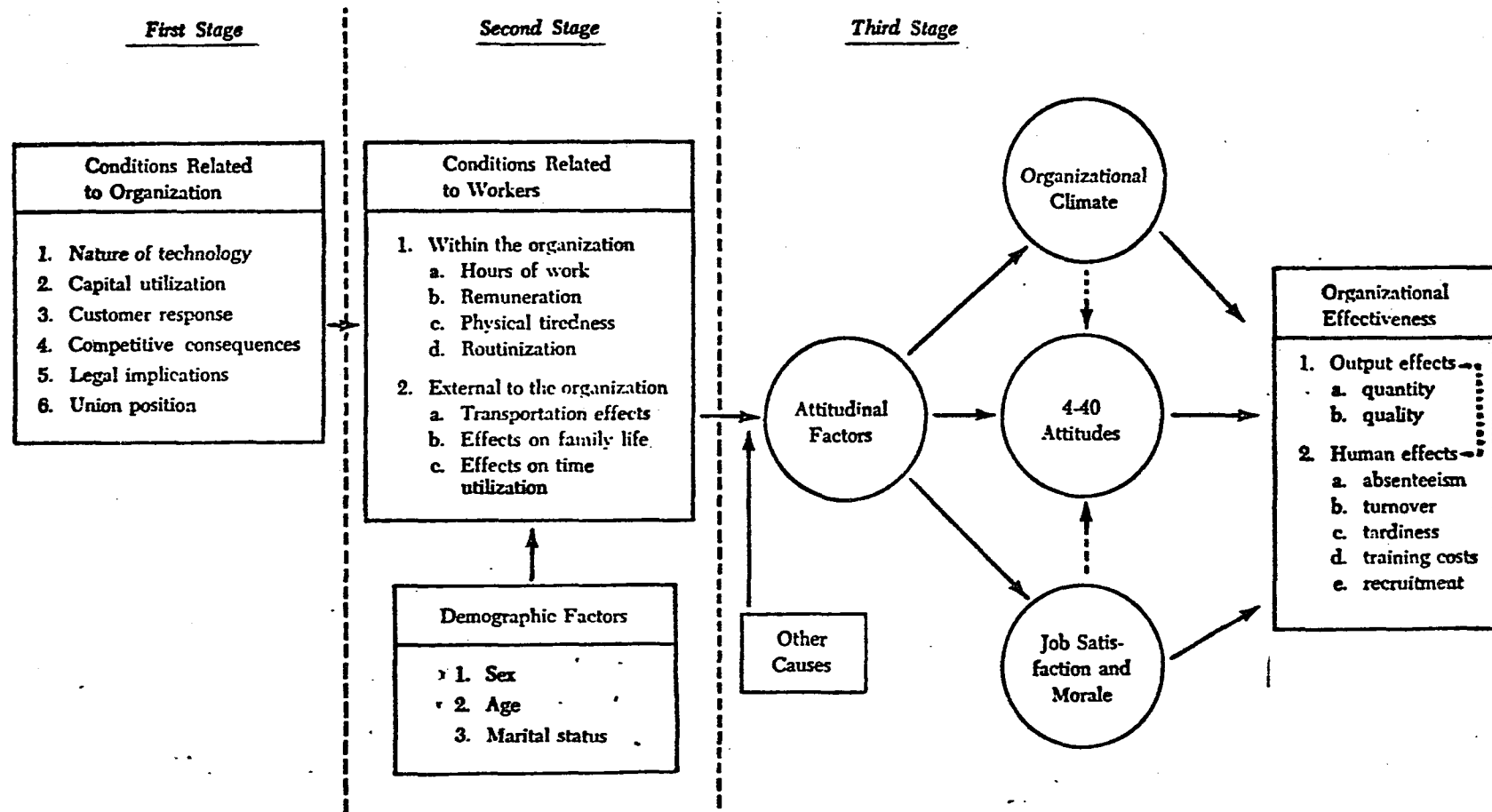
Bishop: "Give and Take in the Working Day"⁵⁷

Bishop's article extended the concept of the four-day week to consideration of "flexible working hours." The concept was designed to permit

⁵⁷T. Bishop, "Give and Take in the Working Day," Personnel Management Vol. 4, (June, 1972), pp. 33-36.

EXHIBIT 2.2

Model for Evaluation of the 4-40 Plan



SOURCE: Don Hellriegel, "The 4-Day Workweek: A Review and Assessment," MSU Business Topics, Vol. 20, No. 2 (Spring, 1972), p. 44.

flexibility in starting and finishing times at work each day.⁵⁸ Satisfaction with the plan was expressed by 99 percent of the employees in one of his test firms. The rapid rise in Europe of the flexible concept (2,000 firms in 1972) was largely due to employee pressures, as opposed to four-day conversions in America which were primarily management initiated.

Two major points made in the article focus on limitations of corporate enthusiasm. Bishop stated, "the link between employee morale and such things as higher productivity, lower absenteeism and so on is tenuous."⁵⁹ He further warned that "claims made for such a system should be looked at with a fairly dispassionate eye, and that realistic goals should be set."⁶⁰ The positive and negative factors associated with operating on a flexible hours plan point to "a bright future" for such plans.

"4-Day, 40-Hour Work Week: Boom or Bust?"⁶¹

The low failure rate of four-day plans, as with the flexible work day in the previous article, provided a reason for conversion. Yet many firms have avoided either plan. This article asks why more firms have not converted. It is stated that some "view the 4/40 as a Herculean hydra ready to sprout unconquerable dangers at every turn."⁶²

⁵⁸Ibid., p. 33.

⁵⁹Ibid., p. 35.

⁶⁰Loc. cit.

⁶¹"4-Day, 40-Hour Work Week: Boom or Bust?" National Petroleum News, Vol. 64, (July, 1972), pp. 90-91.

⁶²Ibid., p. 90.

proponents suggest a 'win, win' situation developed which helped both the company and employees.

A major reason for failure, poor planning, was cited frequently. Conversion to the flexible worktime proposal discussed previously was also cited. Despite numerous potential problems, the article suggested a "boom" rather than bust due to increasing pressures toward increasing leisure blocks.

"How's the Four-Day Workweek Working"

Dun's review of the successes of the four-day plan does not support the earlier negative views discussed previously. Success was cited by practically all the firms surveyed. The Dun's panel stated that there were measurable increases in productivity and decreased in absenteeism.⁶³ These results support prior studies.

The final point the Dun's panel considered was the movement from a 4/40 to a 4/32 workweek. Conclusions appeared to depend on labor's role and attitudes. The panel stated that "we are going to reach the point where the union just can't resist it" in reference to some variation in the standard eight-hour day.⁶⁴ Should labor begin a push for the flexible or four-day schedule, an increasing numbers of firms could be expected to consent.

Werther and Newstrom: "Administrative Implications of the Four-Day Week"⁶⁵ The focal point of the article was the impact shorter

⁶³"How's the Four-Day Workweek Working," Dun's Vol. 100, (July, 1972).

⁶⁴Ibid., p. 54.

⁶⁵William B. Werther and John W. Newstrom, "Administrative Implications of the Four-Day Week," "Personnel Management", Vol. 33, (December, 1972), pp. 18-19.

workweeks had on administrators. The author also briefly discussed most of the same positive and negative potentials from conversion mentioned in earlier works. One unique point, which had some impact on results of the current study, concerned employee turnover. They suggested high turnover prior to conversion could result from personal problems and conflicts of employees.⁶⁶ Another issue mentioned in passing in the article, related to the novelty factor tested in the current study and the implications it had for administrators. On the positive side, the concept of a four-day conversion can act as a change agent within the firm. This supports earlier views and should be investigated in future research. The factors mentioned here suggest an increased need for planning to avoid future problems. This view appeared to be shared by many other writers in this area.

Hedges: "New Patterns for Working Time."⁶⁷

Hedges earlier article on the four-day workweek covered many of the points expressed in this article. Extensions included an analysis of flexible workweeks, and additional variables to consider in a four-day conversion. The flexible workweek mentioned earlier in this chapter, is the avenue of changing work schedules preferred by the Europeans. One of their criticisms of compressed workweeks (four-day plans) was the implication that "work is performed only for money and should be disposed of as expeditiously as possible."⁶⁸ Hedges points out, however, that employee participation was considered in most firms which

⁶⁶Ibid., p. 18.

⁶⁷Janice N. Hedges, "New Pattern for Working Time," Monthly Labor Review, Vol. 96, (February, 1973), pp. 3-8.

⁶⁸Ibid., p. 5.

converted to four-day plans. This participation appears to be one reason for the change agent role attributed to conversion.

Two negative points which were not fully discussed in earlier works related to fatigue and the "Hawthorne Effect." Fatigue had not been fully studied at this time. The limited experience of most firms (less than two years) made the novelty factor additionally important and increased the impact of the results of the current study. The possible alternatives appear to be highly varied in patterns of work and could lead, according to Hedges, to changes in the working year and even lifetime leisure patterns.⁶⁹

"The Changing World of Work"⁷⁰

This article summarized many of the previously stated concepts of work. It is not solely related to a four-day concept, but to the broader reasons such plans are considered. One point of interest is "how work related to increased or decreased satisfaction with life."⁷¹ Suggestions to accomplish this goal included improvements in the place, the organization, and the nature of work to improve both performance in work and the quality of life.⁷² The primary addition to the literature was the recognition that work needed to reflect human values and objectives. One method of applying this would be the four-day conversions, flexible work time and compressed schedules in general. This article formed the

⁶⁹Hedges, loc. cit.

⁷⁰"The Changing World of Work," The Forty-Third American Assembly, Harriman, New York, (November, 1973), pp. 3-10.

⁷¹Ibid., p. 5.

⁷²Ibid., p. 10.

basis for understanding why firms have been successful with conversion to the workweek.

Summary

The literature concerning the four-day workweek has emerged from extremely varied sources. The present research effort is partially based on the literature reviewed in this chapter. Additional sources are cited in the development of hypotheses and construction of statements for the instrument in Chapter III.

From the empirical works reviewed in this chapter, a basic profile and characteristics of the firms included in the studies were obtained for comparative purposes. Also, many of the variables included in the instrument were provided by the lists of advantages and disadvantages which emerged from the literature.

Poor's book supplied ideas while they were still "useful" for research. The sections discussing productivity, absenteeism, turnover, and fatigue were extremely useful in the development of hypotheses.

The AMA study provides results which could be used in a comparative sense in discussing conclusions and implications. Also, the variables cited in the study provide support for those used in this research. It also offers a comparison of ideas between those not on a four-day week and those who had already converted. This is useful in setting the scope of the study and in eliminating sources of error due to a lack of experience on the shortened workweek.

The ASPA-BNA study offers support for the conclusions of the

prior efforts. It also suggests new areas of research by use of its open-ended questions. Furthermore, the classifications used, such as size, number of employees, and turnover rates, among others, are adopted in this study.

The non-empirical efforts provide sources of information from those actually concerned with new work schedules which could be adapted for construction of the scales. They primarily express opinions and provide insights into how people feel about the variables associated with the four-day workweek. Since opinions are the primary source of information, the articles also provide diversity while pointing up the need for more research in the area.

Dun's Panel, for example, differs considerably from the ideas expressed by Simpson on fatigue and productivity. The idea of a novelty factor is also alluded to in these articles. Northrup, Hedges, Murphy, and Hodgson suggested pros and cons of the conversion which aided in designing the questionnaire for the present study.

Organized labor's views, developed by Clayman and Hannigan, suggest the difficulties with fatigue, overtime restrictions, legal restrictions, and general opposition to conversion. These are also included in the study.

The final article by Hellriegel provides a descriptive model to develop the critical factors used in determining what to include in the step-wise regression analysis described in Chapter VI.

The subsequent literature development adds two primary points. First, it increases the discussion of the concept of flexible work time.

Secondly, it appears to broaden the nature of workweek changes to include improvement in the total work environment.

The literature, therefore, provides a foundation on which to base the hypotheses which are tested in this research effort. No prior testing has been undertaken and this omission was justification for a portion of the current research.

CHAPTER III

METHODOLOGY

This research has been undertaken to determine managerial perceptions of the factors underlying successful implementation of a four-day workweek. The development of the hypotheses for testing is discussed in the first part of this chapter. Subjects have been selected from among firms with experience on a four-day workweek. The selection of the subjects studied is discussed in the second part of this chapter. Part three discusses the development of the questionnaire. The sources of the statements that were not developed as hypotheses are also cited. The fourth part of the chapter presents the procedures employed in collecting the data, and the final part presents the statistical procedures followed for analyzing the data.

Development of Hypotheses

Hypotheses are developed where sufficient support is found to exist in the literature. Each of the hypotheses is tested to determine the impact on success exerted by the variables being considered. Hypothesis development is limited to 13 of the 22 variables under consideration. The remaining variables are considered to be

exploratory in nature as there is an insufficient empirical or theoretical base for hypothesis testing. They are discussed later in relationship to the development of the questionnaire.

The hypotheses presented below are stated in the general case to express anticipated directions of interactions. The rationale for inclusion as hypotheses is also discussed. The null form of each hypothesis which is used for statistical testing follows the discussion of each hypothesis.

Hypothesis 1

- H₁ The presence of a labor union will have a significant impact on successful implementation of a four-day workweek.

A basic cause of the increased resistance by organized labor has been the extension of the hours worked per day. George Meany has stated that lengthening the workday beyond eight hours is a step backward in the history of the labor movement.¹ Other criticisms concern overtime payments and holiday schedules. Such questions also still arise in non-unionized firms. Even so, management has greater authority to develop alternative solutions without endangering the program. An example of this is the problem of overtime pay after eight hours required in Federal contract work. Salpukas states that "most small, non-union companies can get around the requirements by having workers agree to a pay cut to balance things out. But this is

¹Eugene Murphy, "4-Days, 40-Hours: Palliative or Panacea?," New Jersey Business (February, 1972).

a major obstacle to companies with unions who are reluctant to tamper with ratified contracts."² Northrup suggests moving to a 4-40 plan may be giving up "hard won gains."³ Union spokesmen also cite fatigue, eroding of labor standards, health hazards and increased isolation from one's family and friends as reasons to disapprove changes in the hours worked per day which are common in conversion to a flexible plan.⁴

H₁ was tested by the null hypothesis:

H₀ There is no significant difference in the impact of the presence of a labor union on successful implementation of a four-day workweek between unionized and nonunionized firms.

Hypothesis 2

H₂ A "novelty" effect will have an impact on the success of conversion to a four-day workweek.

Hedges states that "increased output resulting from the improved morale of many 4-day workers probably cannot be maintained as new work schedules become old work schedules."⁵ This author feels a Hawthorne effect may be operating in some of the conversions. This was suggested by the president of a firm which discontinued this experimental plan. The workers all liked the four-day week, but after

²Agis Salpukus, "4-Day Work Week Getting Mixed Reception," New York Times, (July 16, 1972,) p. 32.

³Herbert R. Northrup, "Reflections on the Ten-Hour Day, Four-Day Week," speech reported in Daily Labor Report, No. 144 (July 27, 1971).

⁴W. Hunter Simpson, Jacob Clayman, and Thomas Hannigan, "The 4-40 Workweek: Two Views," Manpower (January, 1972), pp. 15-16.

⁵Janice Neipert Hedges, "Rearranged Workweek: A Look Ahead," remarks before the AMA Briefing Session, New York City, (March 27, 1972).

six months productivity, absenteeism, and turnover had deteriorated slightly. The plan was discontinued and productivity increased upon the return to a five-day schedule. This is a limited example, but one which seems to justify investigation.

H₂ was tested by the null hypothesis:

H₀ There is no significant difference between managerial perceptions of the "impact of a novelty effect" on successful implementation of a flexible workweek between firms on a permanent four-day workweek and firms that discontinued the four-day workweek.

Hypothesis 3

H₃ Labor-intensive industries will have less difficulty converting to the four-day workweek than capital-intensive firms.

Despite greater difficulty in conversion due to the larger numbers of employees involved in labor-intensive firms, long-run gains may be greater. The gains from conversion are often "people-oriented" and therefore, gains should accrue to the labor-intensive firm. Currently, conversions are primarily limited to firms with under 1,000 employees. These firms would be considered primarily labor-intensive firms.

The principal advantages of proposed changes in the workweek cited in Chapter II show that 11 of the 20 factors are related to "people-oriented" gains. This suggests a high dependence on human factors in a four-day conversion.

Two reasons for this are stated in the ASPA-BNA report which considered reasons for making a change in the workweek.⁶ The only two reasons for conversion appearing more than once were "hope for improved productivity" and "improved employee morale."⁷

H₃ was tested by the null hypothesis:

H₀ There is no significant difference between managerial perceptions of the difficulty of implementation of a four-day workweek between firms which are labor-intensive and firms which are capital-intensive.

Hypothesis 4

H₄ A firm's availability of labor will be increased upon conversion to a four-day workweek.

Previous research results indicate that the selection ratio has increased and firms are able to hire better qualified and skilled employees.⁸ It is expected that the increased selection ratio and higher skill level will lead to increased productivity and greater success of the conversion.

If the availability of labor is increased, it appears that the selection ratio would be more favorable and a firm would select better qualified individuals.

⁶American Society for Personnel Administration - Bureau of National Affairs, Inc., "ASPA-BNA Survey: The Changing Workweek," Bulletin to Management (January 6, 1972), p. 2.

⁷Ibid., p. 7.

⁸Riva Poor (ed.), 4 Days, 40 Hours: Reporting a Revolution in Work and Leisure, with a Foreword by Paul A. Samuelson (Cambridge, Mass.: Bursk & Poor Publishing, 1970), p. 31.

H₄ was tested by the null hypothesis:

- H₀ There is no significant difference between managerial perceptions of the impact on the increase in the availability of labor between firms with adequate, scarce or plentiful supplies of labor prior to the conversion.

Hypothesis 5

- H₅ Fatigue is not a limiting factor on success of a firm's conversion to a four-day workweek.

As previously noted, the AMA study shows firms on a five-day plan felt fatigue due to the longer workday would be a problem.⁹ Four-day firms in the AMA study did not respond this way, however. One reason is that while initial experience shows an increase in fatigue, this quickly passes. An internal report by Western Electric showed that up to twelve hours per day could be worked in most jobs without impairing performance after an initial readjustment period.¹⁰

Fatigue has been cited as a limitation in articles by Kanter,¹¹ Clayman and Hannigan,¹² and numerous others writing about firms who have discontinued a four-day plan. Hedges cited the possibility of increased moonlighting having an adverse effect on the workers which could lower output and increase spoilage.¹³

The debate on fatigue has not been resolved in the literature

⁹Kenneth E. Wheeler, Richard Gurman, and Dale Tarnowieski, The Four-Day Week: An AMA Research Report, Report to General Management Division of the AMA (n.p.: American Management Association, Inc., 1972), pp. 17-18.

¹⁰Interview with John Stormant, Industrial Hygienist and Bio-Mechanic, Western Electric Company, Shreveport, Louisiana, June, 1972.

¹¹Eric L. Kanter, "Thank God It's Friday," in Poor, 4 Days, 40-Hours, p. 49.

¹²Simpson, Clayman and Hannigan, op. cit. p. 19.

¹³Hedges, op. cit. p. 8.

and therefore was included for testing.

H₅ was tested by the null hypothesis:

H₀ There is no significant difference between managerial perceptions of the impact of employee fatigue on successful implementation of a four-day workweek between firms which differ in the hours worked per day.

Hypothesis 6

H₆ Improved job satisfaction of the workforce has a significant impact on the successful implementation of a four-day workweek.

Reports by Poor,¹⁴ the AMA,¹⁵ and the ASPA-BNA¹⁶ indicated that job satisfaction increases after a conversion to a four-day workweek. It appears that firms with low morale and productivity may consider the four-day plan to take advantage of the reported changes. If their hopes are fulfilled, it would be very difficult to return to a five-day schedule. It may be that management will be forced to commit a greater effort to solve problems which arise in the area of scheduling, pay scales, and other situations which arise.

One reason this hypothesis is proposed was to see if firms operating on a changed workweek feel this new satisfaction has a significant impact on success or failure of the conversion.

¹⁴Poor, op. cit., p. 28.

¹⁵Wheeler, Gurman, and Tarnowieski, op. cit., p. 13.

¹⁶ASPA-BNA, op. cit., p. 4.

H₆ was tested by the null hypothesis:

- H₀ There is no significant difference between managerial perceptions of the impact of employee satisfaction on successful implementation of a four-day workweek between firms that consider the change permanent and those that discontinued the plan.

Hypothesis 7

- H₇ Scheduling difficulties have a significant impact on the successful implementation of a four-day workweek.

Just as five-day firms experienced difficulties in the late 1920's, four-day firms are having to come to grips with the problem of scheduling. Continuous process industries have had the most difficulty to date and have often avoided the change because of this.¹⁷ However, some firms are finding that scheduling is easier under a four-day plan and this further increases their chances of success.¹⁸

In order to determine which view is supported by the data in this research, H₇ was tested by the null hypothesis:

- H₀ There is no significant difference between managerial perceptions of the impact of scheduling difficulties on successful implementation of a four-day workweek between firms which currently work different numbers of shifts per day.

¹⁷Wheeler, Gurman, and Tarnowieski, op. cit., p. 3.

¹⁸Linda Sprague, "Breaking the 5-Day Mold: Scheduling Issues," in Poor, 4 Days, 40 Hours, p. 71.

Hypothesis 8

H₈ The percentage of females employed in a firm will have a significant impact on the success of a four-day conversion.

Hodgson reports that women are opposed to the ten-hour day by 2 to 1.¹⁹ Rosenthal reports that the largest complaints of exhaustion were from single women under 25 years of age.²⁰ Other complaints have centered around child-care problems and loss of family contact, and legal restrictions in hours of work for women.²¹ Hedges also discusses the legal restrictions in terms of reduction of total hours, restrictions in night work, and scheduling difficulties.²² These may ease if current legislation gives "equal rights" to women. An article in the Wall Street Journal reports women's responses to a four-day plan. Several women stated that the ten-hour day leaves no time to enjoy social life and increases the difficulty of getting a family off to school or work.²³ These difficulties suggested an adequate basis for the hypothesis.

H₈ was tested by the null hypothesis:

¹⁹Reported in "Now Hear This," Morning Advocate, July 12, 1971, p. 12-A.

²⁰E. M. Rosenthal, "Are Workers Up to the 4-Day Workweek?," Management Review, Vol. 61 (July, 1972), pp. 15-16.

²¹Janice Hedges, "A Look at the 4-Day Workweek," Monthly Labor Review, Vol. 94, No. 10 (October, 1971), p. 36.

²²Ibid., p. 35.

²³William M. Bulkely, "Short Shift: For Some Companies, The Four-Day Week is a Four-Day Headache," Wall Street Journal (April 30, 1973), p. 24.

- H₀ There is no significant difference between managerial perceptions of the impact of the percentage of females employed on successful implementation of a flexible workweek among firms with a high (40%), medium (20-40%), or low (0-20%) percentage of female employees.

Hypothesis 9

- H₉ The size of the firm does not have a significant impact on successful conversion to a flexible workweek.

The American Management Association reports 18,639 employees actually working on some variant of a flexible workweek among 137 four-day companies.²⁴ This is an average of less than 130 employees in each firm on the new schedule. The ASPA-BNA survey presents data "indicating that a change in the workweek is difficult for large companies to accomplish."²⁵

The AMA survey also notes, however, that size did not have an impact on success or failure of the four-day schedule.²⁶ This difference of opinion led to the testing of H₉ by the null hypothesis:

- H₀ There is no significant difference between managerial perceptions of the impact of the size of the firm on successful implementation of a four-day workweek among firms which differ in size.

²⁴Wheeler, Gurman, and Tarnowieski, op. cit., p. 10.

²⁵ASPA-BNA, op. cit., p. 1.

²⁶Wheeler, Gurman, and Tarnowieski, loc. cit.

Hypothesis 10

- H₁₀ The average age of the workforce has a significant impact on the successful implementation of a four-day workweek.

Younger workers have traditionally been considered to have greater flexibility than older workers.²⁷ Douglas Fraser states that the "larger numbers and percentages of youth in the national workforce will undoubtedly produce a greater willingness to innovate and experiment."²⁸ He goes on to state a reason for this willingness to innovate may be due to the routinization of jobs which "leads to a greater effort to increase the amount of time available for cultural and recreational activities."²⁹

Poor and Steele found that in companies converting to a flexible workweek, both younger and older employees "like their company more," although this is more prevalent among younger workers.³⁰

H₁₀ was tested by the null hypothesis:

- H₀ There is no significant difference between managerial perceptions of the impact of the age of the workforce on successful implementation of a four-day workweek between firms whose average age of the workforce is under 35 and firms whose average age of the workforce is over 35.

²⁷C. J. Suchocki, "4-Day Workweek Needs Game Plan for Success," Iron Age, Vol. 209 (March, 1972), p. 65.

²⁸Wheeler, Gurman, and Tarnowieski, op. cit., p. 37.

²⁹Ibid., p. 37.

³⁰Riva Poor and James L. Steele, "Work and Leisure: The Reactions of People at 4-Day Firms," in Poor, 4 Days, 40 Hours, p. 107.

The impact of the four-day workweek on absenteeism, turnover, and productivity is tested in a manner similar to the prior hypotheses. Since the three measures were discussed at length in Chapter II, further justification is not needed here. Suffice it to say that the following hypotheses were also tested.

Hypothesis 11

- H₁₁ Changes in the rate of absenteeism will have a significant impact on successful implementation of a four-day workweek.

This was tested by the following null hypothesis:

- H₀ There is no significant difference between the managerial perceptions of the impact of changes in the rate of absenteeism on successful implementation of a four-day workweek between firms on a permanent four-day workweek and firms that discontinued the four-day plan.

Hypothesis 12

- H₁₂ Changes in the turnover rate will have a significant impact on successful implementation of a four-day workweek.

This was tested by the following null hypothesis:

- H₀ There is no significant difference between the managerial perceptions of the impact of changes in the turnover rate on successful implementation of a four-day workweek between firms on a permanent four-day workweek and firms that discontinued the four-day plan.

Hypothesis 13

- H₁₃ Changes in productivity will have a significant impact on successful implementation of a four-day week.

This was tested by the following null hypothesis:

- H_0 There is no significant difference between the managerial perceptions of the impact of changes in productivity on successful implementation of a four-day workweek between firms on a permanent four-day workweek and firms that discontinued the four-day plan.

The remaining variables are considered to be either background information variables or exploratory in nature. Hypothesis testing is not appropriate at this time for these variables due to a lack of research data. The statements representing the exploratory variables are presented in Exhibit 3.1.

EXHIBIT 3.1

Statements Representing the Exploratory Variables

V_1 Management Commitment

Successful conversion of the company to a flexible workweek is dependent upon the commitment of top management to the change.

Source: Telephone interviews with Riva Poor and Randolph Hale (NAM).

V_2 Experience with Prior Innovation/Change

Positive experience with past changes and innovations improves the capacity of employees to adjust to a flexible workweek.

Source: Poor, 4 Days, 40 Hours: Representing a Revolution Work and Leisure (Cambridge, Mass.: Bursk & Poor Publishing, 1970), p. 28.

V₄ Prior Job Dissatisfaction

Job dissatisfaction prior to conversion to a flexible workweek is correlated with current employee preference for the system.

Source: Martin J. Gannon and B. Keith Reece, "Personality Characteristics, Job Satisfaction - The Four-Day Week," presented to IRRA, December, 1971.

V₅ Job Commitment

A flexible workweek reduces job commitment because employees are more concerned with leisure than their jobs.

Source: Roy Walters, "A Long Look at the Shorter Workweek," Personnel Administration, Vol. 10 (1971); author's interviews with company executives.

V₁₁ Skill Level

The higher the skill level of the workforce, the greater the acceptance of a flexible workweek.

Source: Interviews with company executives.

V₁₅ Overtime Payments

The necessity of overtime payments limits the success of a flexible workweek.

Source: Poor, op. cit., p. 30: Don Hellriegel, "The 4-Day Workweek: A Review and Assessment," MSU Business Topics, Vol. 20, No. 2 (Spring, 1972), pp. 40, 43.

V₁₆ Demand for Higher Wages

Greater opportunities to spend money increase the demands for higher wages by employees.

Source: Interviews with company executives.

V₁₉ Difficulty of Management Job

Increased complexity of the manager's job due to the conversion to flexible workweek may limit its applicability.

Source: Interviews with company executives: "Possible Negative Effects of 4-Day Week Examined," AOI News Digest, Vol. 12, No. 3 (March, 1971).

V₂₁ Prior Planning

Prior planning is a key to successful conversion to the flexible workweek.

Source: Kenneth E. Wheeler, Richard Gurman, and Dale Tarnowieski, The Four-Day Week: An AMA Research Report, Report to General Management Division of the AMA (n.p.: American Management Association, Inc., 1972); C.J. Suchocki, "4-Day Workweek Needs Game Plan for Success," Iron Age, No. 209 (March, 1972), p. 65.

Firms Studied

Only firms with operating experience on a flexible workweek were included in the population studied. In July, 1971, Northrup³¹ and Botwright³² reported 367 firms on a four-day workweek. By February, 1972, Hodgson³³ estimated 700 firms were operating on some variation of a flexible workweek for at least part of the year. While it is recognized that firms were converting at an increasing rate in the past two years, February, 1972, was chosen as a cut-off

³¹Northrup, op. cit., p. 1.

³²Ken Botwright, "The 4-Day Work Week is Spreading," Parade, July 11, 1971, p. 16.

³³J. D. Hodgson, "4-Day Workweek: How Widespread by 1990?", Commerce Today (February 7, 1972), p. 39.

date for three primary reasons:

- (1) Firms with less than six months to one year's experience are considered to be in an early experimental stage and even moderately accurate answers to the questions posed by this study would be difficult to determine.
- (2) It is necessary in any research to limit the scope at some time.
- (3) A partial listing of the 700 firms was available at that time.

Seven hundred (700) thus became the population to be tested. Despite extreme difficulty in obtaining listings and names of firms among this 700, approximately 400 firms were located. This procedure consisted of numerous letters and phone calls and an extensive survey of the literature to develop the list of firms utilized as a sample for the study.

The sample is a selected sample, rather than a random or random stratified sample because the variability of the firms under question made stratification appear to be meaningless in the data collection phase of the study.

The rather exhaustive sample is utilized in an attempt to assure adequate numbers of respondents in each category and to determine the characteristics of the sample. A small sample would not take into account the diversity of the population under study.

The number of firms surveyed and the geographic distribution makes an adequate interviewing program impractical. Therefore,

within the selected sample of 400 firms, top management officials identified as being involved with the conversion are selected to respond to the written questionnaire covering their firm's experience with the flexible workweek.

Names of respondents were obtained from three sources. First, Standard and Poor's Directory of Corporation Officers is used. A second method of locating names of the company presidents and vice-presidents is simply calling telephone information for the company and town and asking who the officers were. While rather inefficient, it does allow a greater number of firms to be used. Third, names have been obtained from articles and reports concerning firms operating on a flexible workweek.

Company presidents and vice-presidents have been selected as the primary group because it is felt they would have the greatest total knowledge of the firm's standing since the conversion or would be able to delegate the gathering of the desired information. Also, in areas where specific data are required, top officials are assumed to be in the most favorable position to obtain the desired information.

Where specific individuals other than company presidents or vice-presidents were mentioned in articles, the questionnaire has been sent to that individual to utilize his association with the conversion.

It is recognized that an adequate response rate might be difficult to obtain because of the large number of queries firms

are receiving. The large sample helps alleviate the problem by using firms not studied before. Also, the respondents are assumed to be motivated toward increasing their understanding and knowledge concerning other firms' experiences. Therefore, the firms have been informed that a synopsis of the study will be made available if they cooperate.

The profile of the 139 responding firms is similar to prior research in areas such as unionized (23) and non-unionized firms (116), and suggests the sample was representative of the population in question. A complete profile is presented in Chapter IV.

Questionnaire

The questionnaire used in this study consists of two separate parts. A sample copy of the questionnaire which is used in both the mail survey and pre-test phase is found in Appendix A.

Page one consists of a cover letter which states the purpose of the research, the reasons why the respondent's firm was selected for this study, and the importance of the research. Since data is being requested which would be of a confidential nature in many firms, great care is taken to assure the respondents that no specific firm's name is required or even desired. It is felt this would have a positive impact on the overall response rate.

The data gathering sections, Parts I and II, make up the remainder of the questionnaire. A brief explanation of the objectives of each part precedes the actual questions. This is emphasized so

that each respondent will be sure to report on the experience in his firm.

Part I is primarily a compilation of profile characteristics which are deemed important enough to be included in the instrument and are reported for comparative purposes in Chapter IV. Responses for questions 1 through 20 are simply check-type responses to decrease the time needed to complete the instrument.

Questions 21 through 24 are used to determine changes in productivity, absenteeism, annual personnel turnover, and the overtime rate. This is accomplished by requesting data concerning each of the above areas prior to and since the firm's conversion. A range of responses is provided in each category to allow comparability of responses.

Part II provides instructions for responding to a series of statements representing the respondent's perceptions. Each statement represents one of the 22 independent variables under consideration. As discussed later in this chapter, the statements are based on ideas expressed in the literature.

Two eight-point interval scales are used to score the responses. The first scale is designed to be an attitudinal measure of agreement or disagreement with the given statement. An attitude scale is deemed appropriate since Thurstone suggests that an attitude scale can be used where the researcher can "reasonably expect people to tell the truth about their convictions or opinions."³⁴

³⁴L.L. Thurstone, The Measurement of Values (Chicago: University of Chicago Press, 1959), p. 210.

Due to the autonomy and lack of any gain to the respondent from falsifying data, it is reasoned that the intended purpose fit Thurstone's criterion.

The second scale deals with managerial perceptions of the impact each variable has on a firm's success in implementation of the four-day workweek. The difference in the scales is primarily one of attitudes versus perception of factual experiences. A difference in replies was found in the scales, so the instrument did provide differentiation in this area. The differentiation is considered necessary to judge whether the respondents reply on the basis of their attitudes or their perceptions of their firm's experiences.

Since research of this type has not been done before, the statements themselves had never been validated as measuring what they were intended to measure. To minimize validation difficulties, most statements have been selected only after similar thoughts are expressed in the literature. A review of over 200 sources constitutes the primary means of selection. Also, interviews with company officials suggested some of the statements. Discussion with faculty members, graduate students, and others helped reduce the number of statements from approximately 190 to the 22 utilized in the instrument. The pre-test also aided in formulating the most appropriate statements.

Pre-Test Procedure

The questionnaire was pre-tested by contacting six firms in the Midwest to request a meeting with company officials to interview them and administer the questionnaire. This was done to determine the appropriateness of the statements. The completion time was also recorded to eliminate time limitations.

Also, 17 selected graduate students familiar with the concept of the flexible workweek responded from a set of assumptions provided by the author. This was done primarily to determine the time necessary to complete the questionnaire, the proper physical layout of the instrument, and the understandability of the instructions.

The time required for completion fell within the estimated 10-12 minutes for most respondents. The only difficulty was in determining data for questions 21 through 24. This is recognized as a limitation, but it is felt that the data was valuable enough to attempt to collect it.

No major changes resulted from the pre-test and the subjects reported that the instructions were clear and that the data would be available in most firms. One question was raised concerning the differentiation of the two scales in Part II, but after tabulating the returns this did not prove to be a problem. The only changes which did occur were in the wording of some of the requests for information.

The instrument was printed and distributed to the selected firms by mail.

Procedure

The mailed questionnaire was sent to the selected firms on April 20, 1973. The purpose of the study was made clear in the cover letter and repeated in the instructions. Care was taken to assure that instructions for completing the questionnaire, returning it in the envelope provided by the author, and for requesting a synopsis of the study were clear.

Approximately 10 days after the original mailing, a follow-up letter (see Appendix B) was sent to each of the firms in the sample. This letter stressed the need for their cooperation and requested them to complete the questionnaire and return it as soon as possible. If they had already responded, the letter thanked them for their assistance. The follow-up letter appeared to increase the response rate significantly, as well as locate some firms not receiving the original questionnaire. In these instances, another copy was sent immediately.

As responses were received, they were reviewed to determine their usability for the research. Returns which did not respond properly to the questions were eliminated. Also, replies were received from nine firms which were not on a flexible workweek and answered Part I and the first scale of Part II. They explained this in a letter and "wanted to help." These were also eliminated from the data analysis.

Once a questionnaire was determined to be usable, it was assigned a number for tabulation purposes. This number corresponded

to IBM card numbers on which the data were summarized for analysis purposes. Each question was assigned a card space and a numerical value was assigned to each possible response for questions 1 through 24 for frequency distribution tabulations. The card format corresponds to standard procedures.

One hundred eighty-five (185) firms of the 400 firms sampled responded to the questionnaire. This produced an overall response rate of 46 percent. Of these, 139 were determined to be usable for the analytic purposes, yielding a usable response rate of 35 percent. Of the 46 returns which were not usable, 17 did not respond to the questionnaire, but sent considerable data concerning their operations which was useful for explanatory purposes.

Techniques of Data Analysis

Three basic approaches to analyzing the data are used in the current research. The first portion of the analysis (see Chapter IV) is designed to develop profile characteristics of responding firms so comparisons can be made between the current research and the American Management Association (AMA) and American Society of Personnel Administration-Bureau of National Affairs studies. These were the only major follow-up studies to Poor's original study. This is done to determine the comparability of the three samples and shows the factors previous works omitted in their considerations. The new information and suggested validity of the areas where prior research was conducted leads to new means of analyzation of data pertaining to the four-day concept.

Prior research omitted any hypothesis testing. A program of hypothesis testing is developed in the current research to fill this gap. Each of the hypotheses is tested through a one-way analysis of variance to determine significance at the .05 level. This testing is designed to determine the impact on success exerted by each of the variables under consideration. The second scale in the questionnaire, referred to as the "B" scale, serves as the primary basis for the hypothesis testing. The purely attitudinal scale of agreement or disagreement referred to as the "A" scale is used as a supportive measure of the "B" scale and to suggest managerial attitudes toward the four-day concept.

Another unique extension of the statistical tools is the development of a series of independent step-wise regression equations. This extension is considered to be highly exploratory since definite measures of each of the independent variables are not available. The scale scores from the "B" scale are used for the development of the equations. Four equations are developed from the dependent variables: absenteeism, turnover, productivity, and employee satisfaction. Each dependent variable leads to one step-wise regression equation. An Optimum Regression Technique is used as a cross-check, to determine the suitability of the regression technique.

Only variables meeting the .05 significance level are included in the resultant equations. This combined approach to analysis is designed to extend the prior research and quantify "arm-chair" data.

CHAPTER IV

PROFILE AND CHARACTERISTICS:

RESULTS AND ANALYSIS

This chapter presents the first portion of the summary analysis of the data gathered in this research effort. Characteristics of responding firms are compared with those discovered in the American Management Association (AMA) study and the combined effort conducted by the American Society of Personnel Administrators-Bureau of National Affairs (ASPA-BNA). The findings in Poor's original study are also considered.

Characteristics of Responding Firms

This section reviews the 20 questions posed to develop a profile of firms which had had experience with a four-day workweek. Table 4.1 compares the results of the present study to the American Management Association Study and the American Society of Personnel/Bureau of National Affairs research. Each of the reporting characteristics are considered in the following paragraphs.

Table 4.1

Reporting Characteristics of Responding 4-Day Firms:
 A Comparison with Prior Research Results
 (In Percentage Terms)

		Present Study (Percent)	AMA (Percent)	ASPA-BNA (Percent)
1. Adoption Date	Pre-1970	12	12	18
	1970	23	12	15
	1971	55	69	64
	Feb.- 1972	10	N.A.	N.A.
2. Status of Conversion	Permanent	64	92	73
	Experimental	27	92	24
	Discontinued	9	8	N.A.
3. Number of Employees	1-1000	88	N.A.	83
	Over 1000	12		17
4. Number of Employees Affected by Conversion	1-50	43	N.A.	28
	51-100	17		10
	101-200	14		20
	201-500	15		20
	501-1000	7		9
	Over 1000	3		3
5. Type of Industry	Manufacturing	73	49	N.A.
	Retail	3	3	
	Service	18	9	
	Public	3	6	
	Other	3	33	
6. Union Status	Union	17	15	N.A.
	Non-union	83	85	
7. Labor/Capital Intensity	Labor-Intensive	61	N.A.	N.A.
	Capital-Intensive	39		
8. Geographic Location	Northeast	28	24	N.A.
	Northwest	7	20	
	Southeast	19	19	
	Southwest	10	8	
	Midwest	36	29	
9. Average % Sales Due to Gov't. Contracts	0-10%	78	N.A.	N.A.
	10-20%	13		
	20-30%	3		
	30-40%	3		
	40-50%	1		
	Over 50%	1		

		Present Study (Percent)	AMA (Percent)	ASPA-BNA (Percent)
10. Percentage of Female Employees in the Affected Work Group	0-10%	31	N.A.	N.A.
	10-20%	9		
	20-30%	12		
	30-40%	9		
	40-50%	15		
	Over 50%	23		
11. Average Age of Employees in the Affected Work Group	18-25	4	N.A.	N.A.
	26-35	50		
	36-45	43		
	46-55	2		
12. Average Skill Requirement in the Affected Work Group	Unskilled	4	N.A.	N.A.
	Semi-skilled	49		
	Skilled	30		
	Prof/Tech	12		
13. Availability of Labor (Prior to Conversion)	Plentiful	12	N.A.	N.A.
	Adequate	62		
	Scarce	26		
14. Changes in Total Wage Bill	Increased	41	N.A.	N.A.
	No Change	49		
	Decreased	11		
15. Number of Shifts Worked by the Affected Work Group	One	60	58	N.A.
	Two	30	32	
	Three	8	11	
	Four	1	N.A.	
16. Length of Work Day (After Conversion)	8-8½ hours	14	6	28
	9-9½ hours	25	11	28
	10 hours	56	60	48
	Other	5	23	24
17. Percentage of Persons Moon- lighting in the Affected Work Group	0-5%	67	N.A.	N.A.
	6-10%	16		
	11-15%	10		
	16-20%	4		
	Over 20%	4		
18. Number of Other Firms on Four- Day Plan in Your Metropolitan Area	0-5	67	N.A.	N.A.
	5-10	19		
	11-15	5		
	Over 15	10		
19. General Economic Outlook at Conversion	Excellent	33	N.A.	N.A.
	Good	52		
	Fair	12		
	Poor	2		
20. Overall Manage- ment Satisfaction With Conversion	Satisfied	76	N.A.	79
	Not Satisfied	11		1
	Too Soon To Tell	13		14
	Other	N.A.		6

Adoption Date of the Flexible Workweek

Table 4.1 shows a strong similarity between the adoption dates in the three studies. It also shows the increasing conversion rate which occurred from 1970 to 1971. The higher percentage of firms converting in 1970 in the current research may be due to the extensive search for firms on a four-day week. A major reason for considering adoption dates is to determine the long-run potential of the four-day programs. This is discussed further in the hypothesis testing phase of the study.

Status of the Conversion

Status of the conversion is utilized extensively in the hypothesis testing phase to determine differences between firms currently on the four-day week and those that had discontinued the plan. The AMA estimates a 10-15 percent failure rate.¹ Inadequate planning and poor management techniques caused the plans to fail. The current research found only a nine percent rate of failure. Despite the lower failure rate, the hypothesis testing indicates that an additional factor, the "novelty" effect, may increase the failure rate as firms gain more experience with the four day workweek.

Number of Persons Employed

For comparative purposes, the results of the current study re-

¹Kenneth E. Wheeler, Richard Gurman, and Dale Tarnowieski, The Four-Day Week: An AMA Research Report, Report to General Management Division of the AMA (n.p.: American Management Association, Inc., 1972) p. 5.

garding size of firms are very similar to the ASPA-BNA report. This also supports the belief that the movement to the four-day week has been primarily a small business phenomenon. Several large firms are experimenting with the concept, however. Also, while figures are not available for the AMA study, they concluded that size in terms of number of employees "had little if anything to do with success or failure of the four-day schedules."² The hypothesis testing portion presented in the next chapter supports their view.

Number of Persons Affected by the Schedule

The number of persons affected by the schedule is considered to analyze the extent of the implementation phase of a four-day plan. The data show that only three percent of the firms actually have more than 1000 employees on the schedule, while the prior question showed 12 percent had over 1000 employees. This result is not surprising because of the number of trial programs and partial implementations of the four-day plan. The ASPA-BNA study reports that "68% of the newly adopted schedules do not apply to all employees."³ Often those not covered are management officials, office personnel, and outside sales people subject to a greater interface with firms not operating on a four-day workweek.

²Ibid., p. 5.

³American Society for Personnel Administration (ASPA)-Bureau of National Affairs, Inc. (BNA), "ASPA-BNA Survey: The Changing Workweek," Bulletin to Management (January 6, 1972), p. 2.

Type of Industry (Primary Classification)

The current study shows a higher percentage of manufacturing firms than the AMA report (73 percent to 49 percent). This difference may be due to sampling differences. Another reason appears to be that this research included several months not considered in the AMA study. No additional reasons for the difference between the percentage of firms reported in the service sector (18 percent to 9 percent) were discovered.

Union Status

Over 80 percent of the respondents in the studies under consideration are non-union. Numerous reasons for this high percentage appear to exist. Union leaders oppose the longer work day without overtime which is associated with four-day conversions. Fears of fatigue, injury, and isolation by union leaders were discussed in Chapter II and further explain the higher percentage on non-union firms experimenting with the four-day proposals.

The most significant reason, however, may be that the conversion to a four-day schedule has been primarily a management innovation. The AMA reports that management initialed the plan in approximately 90 percent of the firms surveyed.⁴ The ASPA-BNA study reports that 73 percent of the four-day plans originated from management.⁵

⁴AMA Report, op. cit., p. 12.

⁵ASPA-BNA Report, op. cit., p. 3.

Labor Intensiveness versus Capital Intensiveness

No comparative data are available concerning the impact of labor-intensiveness or capital-intensiveness. It was reasoned that labor-intensive firms are more likely to benefit initially from a four-day schedule because of the positive results reported in employee satisfaction. More firms were found to be labor-intensive (61 percent) than capital-intensive (39 percent). The hypothesis testing phase of the study also supports the idea that labor-intensive firms may have a greater potential for success than capital-intensive firms.

Geographic Location

This is considered to determine the geographic scope of the new schedules. The AMA report and the current research show that the Northeast (24 percent/29 percent) and the Midwest (29 percent/36 percent) lead in adoptions of the new schedules. No firm basis was found to indicate why this was the case. Despite the higher percentages for these regions, (which may be due solely to higher population areas) Table 4.1 shows the plan is represented in nearly all regions of the country.

Average Percentage of Sales due to Government Contracts

Prior data is not available in this area. The information is considered to be exploratory, but useful in light of the legal restrictions an employer could face when operating on government contracts. This was not found to be a significant factor in this research since 78 percent

of the firms had less than 10 percent of their sales from government contracts. This factor when combined with the size of the firms mentioned earlier, suggests that the influence of government contracts was not critical at this time. As larger firms consider the plan, however, it may be necessary to do further research on this factor.

Percentage of Female Employees

Varied opinions concerning women working a longer day led to the gathering of data on this factor. Other reports considered the impact but did not obtain data which could be used to determine whether the percent of female employees was a significant variable. Hypothesis testing is used to show the impact the percentage of females employed had on success. The results are presented in the next chapter.

Average Age of Employees

A determination of the average age of the affected work group is obtained to test the views presented in Chapter III. These views suggested that younger workers are more flexible and have a greater willingness to innovate and experiment. Poor and Steele indicated that younger workers generally "liked their company more" after conversion.⁶ Comparative data for specific age groups were not available in the prior

⁶Riva Poor and James L. Steele, "Work and Leisure: The Reactions of People at 4-Day Firms," in Poor, 4 Days, 40 Hours, p. 109.

studies under consideration. The current research shows that 50 percent of the responding firms indicate their employees are in the 26-35 year old age category. (See Table 4.1). The significance of this age factor is discussed further in the hypothesis testing portion of this research.

Average Skill Requirements

Prior research did not consider the impact of the average skill requirements upon implementation of the four-day workweek. This omission led to its inclusion in the current research. Table 4.1 indicates that only four percent of the responding firms employ a predominantly unskilled work. One reason for this low percentage could be a greater potential for fatigue in this work group. This fatigue could negate the previously reported benefits from conversion.

Availability of Labor (prior to conversion)

Poor, in Chapter III, reported that the selection ratio improved after conversion to a four-day plan. This factor was considered to determine its potential impact on conversion. The results indicate that only 12 percent of the responding firms had plentiful supplies of labor, suggesting that improvement may be possible for the remainder of the firms. The other studies being considered in this section did not present data concerning the availability of labor.

Changes in Total Wage Bill

Neither the AMA nor the ASPA-BNA studies reported data concerning changes in the total wage bill which could be used for comparative purposes in this section. The potential impact of this factor on costs and profitability of the firm led to its consideration.

It appears significant that, despite longer workdays in firms converting to a four-day plan, 49 percent reported no change in the total wage bill, and 11 percent reported a decrease. The higher percentage of non-union firms among those converting partially explains this situation. However, those reporting an increase (41 percent) are greater than the percentage (17 percent) of unionized firms in the sample indicating that changes in the wage bill do not solely depend on a firm's union status.

The data failed to establish any clear pattern concerning the reasons for changes in the total wage bill, implying a need for further research.

Number of Shifts Worked

The number of shifts worked could have an impact on factors such as scheduling difficulties, fatigue, availability of labor, and changes in the total wage bill.

The small number of firms reporting three shift operations in the current research (eight percent) and the AMA study (11 percent) indicates that firms operating in this manner may perceive problems in the aforementioned areas. The AMA report suggests that since 43 percent of the respondents were on two-and three-shift schedules, it may be a mistake to

assume that such operations are not candidates for a four-day schedule.⁷ The corresponding 38 percent in the current research indicates the possibility of similar conclusions.

A four-day plan seldom requires stopping all operations during the remaining three days. This mode of operation could account for the seemingly large number of two-shift operations adopting a four-day plan.

Length of the Work Day

Both of the studies under consideration in this section determined the length of the work day. The most widely adopted schedule is the four-day, 40-hour week (See Table 4.1). The reported results are similar in all the studies.

A primary purpose for consideration of the length of the work-day is the fatigue factor. This relationship between length of the work day and fatigue is discussed in the hypothesis testing section of the following chapter.

Percentage of Persons Moonlighting

Data concerning this factor were not available in the other studies under consideration. The factor is considered, however, to determine the extent of moonlighting among firms upon conversion to a four-day workweek and the impact this could have on their operations. The possible adverse affects of increased fatigue on output and

⁷AMA Report, op. cit. p. 9.

spoilage were mentioned in Chapter III.

The data indicates that 67 percent of the firms responding believe that less than five percent of the workforce was moonlighting. Comments from the respondents indicated there is little concern with this factor at the present time.

Number of Other Area Firms on a Four-Day Plan

This factor is considered to determine if advantages such as an increased selection ratio are affected by the number of four-day firms in the area. The data indicate that 67 percent of the firms reported little four-day competition. Comments revealed, however, that several of the firms were not aware of the number of firms in their area operating on a four-day plan. The indication was that little impact was felt by such competition. This could be due to the relatively small number of firms on such plans.

General Economic Outlook at Time of Conversion

This factor is considered to determine the impact of economic conditions on conversion. There are two possible interpretations. If conditions are fair or poor, a firm might consider the four-day concept to increase productivity and lower overhead in order to minimize the impact of such economic conditions.

In a positive period, tight labor conditions could exist, prompting the conversion to be "unique" and attract better workers. Also, at this time the crisis form of operation may not be as prevalent and more time could be devoted to planning. Planning has been reported to be a significant factor relating to the success of prior

conversion attempts. Since prior study results were not available, consideration of this factor was highly exploratory in nature.

Overall Management Satisfaction with Conversion

Management satisfaction with the four-day plans has been positive. In both the current study and ASPA-BNA report, the satisfaction level (76 percent/79 percent) was extremely high. Where positive results in areas such as productivity and turnover have resulted, there is little room for dissatisfaction. Those expressing dissatisfaction correlated strongly with those not experiencing the anticipated advantages of conversion. Current satisfaction among four-day firms was considered to be an important factor in the potential for adoption by other firms. As positive results are disseminated, other firms are expected to consider conversion.

Summary of Characteristics

Nine of the selected characteristics were not considered in the prior research which is compared to the present study. These characteristics include: average percent of sales to government, percentage of female employees, average age of employees, average skill requirements, availability of labor, changes in the total wage bill, percentage of persons moonlighting, number of area firms on a four-day plan, and the general economic outlook at the time of conversion. Because of the exploratory nature of the current research relative to these characteristics, further research is needed to verify the results obtained in this study.

Comparisons were made between the current research effort and at least one of the prior studies for the remaining eleven characteristics. These comparisons yielded no unreconcilable differences. In light of this fact, the information obtained through the reporting characteristics is further analyzed by hypothesis testing in Chapter V.

CHAPTER V

ANALYSIS OF HYPOTHESES

This section presents the results of the hypothesis testing undertaken in this study. As noted in Chapter III, the hypotheses are developed from information in the existing literature. Each of the hypotheses is tested to determine the impact on success exerted by the variables under consideration. The measure of the impact on success is determined from the second scale (See Appendix A) used in the Questionnaire. This scale, which will be referred to as the "B" scale, served as the primary basis for the hypothesis testing.

The first scale from the questionnaire is purely attitudinal and measures the respondent's level of agreement or disagreement with each statement. This scale will be referred to as the "A" scale for purposes of discussion. Exhibit 5.1 summarizes the results obtained from testing each of the 13 hypotheses developed earlier (See Chapter III). This exhibit compares the computed value from the "B" scale and the F-table values to determine if the corresponding Null hypotheses must be accepted or rejected at the .05 level. An asterik indicated that the respective hypotheses are also significant on the aforementioned "A" scale. This scale is used for discussion purposes only. A plus for the "B" scale and a double plus sign for the "A" scale

denotes those hypotheses which are significant at the .10 level and are considered "approaching significance."

EXHIBIT 5.1

Results of Hypothesis Testing at .05 Level

	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null</u>
H ₁	1.71	3.92	No*
H ₂	5.74	5.17	Yes*
H ₃	3.95	3.07	Yes*
H ₄	.638	3.07	No
H ₅	1.234	3.07	No
H ₆	16.508	11.59	Yes*
H ₇	1.24	3.92	No
H ₈	.456	3.07	No*
H ₉	.642	2.45	No
H ₁₀	.859	3.92	No
H ₁₁	2.75	3.96	No ⁺⁺
H ₁₂	.400	3.96	No
H ₁₃	21.82	3.96	Yes*

+ Based on "B" scale significant at .10 and considered in the discussion as "approaching significance."

* Significant at .05 for "A" scale.

++ Significant at .10 for "A" scale and considered in the discussion as "approaching significance."

Hypothesis 1: The presence of a labor union will have a significant impact on successful implementation of a four-day workweek -- Table 5.2 shows the relationship between managerial perceptions of the impact of unionized versus non-unionized operations on the successful implementation of a four-day workweek. The one-way analysis of variance test results shown in Table 5.2 indicate that there was not a statistically significant difference (at the .05 level) between the impact on success across the two groups. This seems to indicate the emphasis placed on problems in converting unionized firms to a four-day workweek may have been exaggerated. The finding on the current hypothesis does not support the view expressed in Chapters II and III that the presence of a union would have a significant impact on success of the conversion. This is somewhat surprising based on the strength of the negative views of both labor leaders and managers. Table 5.2 shows that the mean response was greater in unionized firms, but the small number (24) of unionized firms responding was not sufficient to provide a statistically significant difference. Based on this finding, the null hypothesis was not rejected.

Further investigation based on testing the attitudinal "A" scale from the questionnaire tested the attitudes of the responding managers toward whether they felt the presence of a union would have an impact on success. This approach was used to allow consideration of the respondent's attitudes toward the impact of the presence of a union on success, despite the lack of a union in their current operations. The result of testing in this manner shows a significant number (at the .05 level)

TABLE 5.2

Summary Data and Analysis of Variance of Data Testing the Impact of a Labor Union on Success Between Unionized and Non-Unionized Firms

	<u>Unionized Firms</u>		<u>Non-Unionized Firms</u>	
n	24		115	
\bar{X}	5.75		4.99	
<hr/>				
<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	11.429	11.429	1.71
Within groups	<u>137</u>	<u>915.491</u>	6.682	
	138	926.920		

Null Hypothesis: There is no significant difference between managerial perceptions of the impact of the presence of a labor union on successful implementation of a four-day work-week between unionized and non-unionized firms.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	1.71	3.92	NO

of the respondents felt that the presence of a union would make a difference in implementation of a flexible workweek. This finding supports earlier observations that the presence of a union will make a difference in the success of implementing a flexible workweek.

The apparent difference in results appears to be caused by the fact that so few firms in this sample were unionized. In those firms which were non-unionized no measure of the impact on success could be determined since the firm did not have to consider a union when analyzing their success. The mixed results indicate that more consideration of this variable is needed.

Hypothesis 2: A "novelty" effect will have an impact on the success of conversion to a four-day workweek -- Table 5.3 presents the results of testing the impact of the "novelty" effect (See Chapter III) on success between firms that considered the conversion permanent and those who discontinued conversions. The analysis of variance test results indicate that there is a statistically significant difference (at the .025 level) between the managerial perceptions of the impact of a "novelty" effect on successful implementation of the four-day workweek in the direction hypothesized.

The finding supports the observations discussed in Chapter III. The strength of the relationship suggests that the impact of the "novelty" effect is a significant factor as the length of time under the four-day plan increases.

Testing of the attitudinal "A" scale also suggests the existence of the "novelty" effect (at the .05 level). The occurrence of the

TABLE 5.3

Summary Data and Analysis of Variance of Data Testing the impact of the "Novelty" Effect on Success Between Firms with Permanent and Discontinued Four-Day Conversions

	<u>Permanent Conversion</u>		<u>Discontinued Conversion</u>	
$\frac{n}{\bar{X}}$	89		12	
	3.685		5.417	
<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	31.694	31.694	5.74
Within groups	99	546.108	5.516	
	100	577.802		

Null Hypothesis: There is no significant difference between managerial perceptions of the "impact of a novelty effect" on successful implementation of a flexible workweek between firms on a permanent flexible workweek and firms that discontinued the four-day workweek.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.025	5.74	5.17	YES

reported novelty effect on both scales seems to indicate that some of the reported gains, such as increased productivity, may not be as enduring as some observers indicate. This may be due to other problems within the firm which were not solved by the conversion. It also appears to support prior motivation theory concepts that satisfied needs no longer motivate. Therefore, once the "newness" of the conversion wears off then "Thursday" may generate the same perception as "Friday." Based on these results, the "novelty" effect appears to be a factor which does have an impact on success. Consideration of this result appears to be essential to the long-run success of future conversions.

Hypothesis 3: Labor-intensive industries will have less difficulty converting to a four-day workweek than capital-intensive firms -- The relative difficulty in converting to a four-day workweek between labor intensive and capital intensive firms is considered by the testing of hypothesis H₃. Table 5.4 shows the relationship between managerial perceptions of the difficulty of implementation of a four-day workweek between labor-intensive and capital-intensive firms.

Although prior evidence was limited, the discussion in Chapter III suggests that one reason for conversion was to improve employee morale. Because of the positive employee perceptions of the change, more potential benefits may accrue to the labor-intensive firms. The high significance level (.025) strongly suggests that the labor-intensive nature of the firm will have an impact on the success of implementation.

TABLE 5.4

Summary Data and Analysis of Variance of Data Testing the Likelihood of Success of a Four-Day Conversion Between Labor-Intensive and Capital-Intensive Firms.

	<u>Labor-Intensive</u>	<u>Capital-Intensive</u>
$\frac{n}{\bar{X}}$	85 5.365	42 4.309

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	2	32.539	16.269	3.95
Within groups	<u>127</u>	<u>523.336</u>	4.121	
Total	129	555.876		

Null Hypothesis: There is no significant differences between managerial perceptions of the difficulty of implementation of a four-day workweek between firms which are labor-intensive and firms which are capital-intensive.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.025	3.95	3.07	YES

The relationship was also supported by the attitudinal "A" scale result (at the .05 level). This agreement with the proposed impact on success indicates that managers with operating experience on a four-day workweek feel that there are greater chances of success in conversion to a four-day workweek in labor-intensive firms than in capital-intensive firms. This belief is relevant since the attitudes of managers is generally considered an important variable in the acceptance or rejection of proposed changes in the business system.

A point of caution in acceptance of this logic is the result of hypothesis H₂ which indicated a "novelty" effect may occur. While implementation may have been less difficult in labor-intensive firms, the long-run impact could be to reduce potential for success.

Hypothesis 4: A firm's availability of labor will be increased upon conversion to a four-day workweek-- Table 5.5 shows the relationship between the availability of labor and success among firms in adequate, plentiful, or scarce labor situations prior to conversion. Prior research reported improvement in the selection ratio. The results reported in Table 5.5 indicate that the test groups' perceptions of the increase in the availability of labor after successful implementation of the four-day workweek are not statistically significant. These results, therefore, do not adequately support such contentions of the prior research.

While no significant difference in responses was indicated, the direction of results did support the contention that the availability of labor was increased. Approximately 52 percent of the respondents (72/139)

TABLE 5.5

Summary Data and Analysis of Variance of Data Testing the Impact of the Availability of Labor on Success Among Firms in Adequate, Plentiful, or Scarce Labor Situation Prior to Conversion

	<u>Adequate</u>	<u>Plentiful</u>	<u>Scarce</u>
$\frac{n}{\bar{X}}$	86 5.314	17 5.882	36 5.528

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	2	4.970	2.485	.638
Within groups	<u>136</u>	<u>529.260</u>	3.892	
Total	138	534.230		

Null Hypothesis: There is no significant difference between managerial perceptions of the impact on the increase in the availability of labor on successful implementation of a four-day workweek between firms with adequate, scarce or plentiful supplies of labor prior to the conversion.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	.638	3.07	NO

so indicated. On the attitudinal scale, 67 percent (93/139) expressed high levels of agreement with the idea the availability of labor was increased by the conversion. This supports the hypothesis tested.

Firm's reporting plentiful supplies of labor reported the highest mean response (5.88) of the three groups. This result appears to indicate that despite a plentiful labor situation, part of the success of the conversion was due to an improved selection ratio.

The data suggests more testing is needed to accurately determine the long-run impact of conversion to a four-day workweek on a firm's availability of labor.

Hypothesis 5: Fatigue is not a limiting factor on success of a firm's conversion to a four-day workweek--Table 5.6 presents the three groupings used to test the impact of fatigue on success. In order to increase the size of each group to permit testing of the hypothesis, these firms reporting "8 hours" and "8½ hours" were combined to form one group. Firms reporting "9 hours" and "9½ hours", to form the second and third test groups. Table 5.6 shows that no statistically significant difference (at the .05 level) was found between the impact of fatigue on success and the hours worked per day.

The responding firms disagreed considerably whether an increase in employee fatigue occurred. The means (see Table 5.6) show a pattern similar to tha expressed in the AMA study cited in Chapter II. Just as five day firms (who normally work shorter hours per day) felt that fatigue would influence success, those working the fewest hours had

TABLE 5.6

Summary Data and Analysis of Variance of Data Testing the Impact
on Success of Fatigue Between Firms on Workdays of Differing Lengths

	<u>8-8½ hours</u>	<u>9-9½ hours</u>	<u>10 hours & over</u>
<u>n</u>	19	35	84
<u>X̄</u>	5.21	4.31	4.27

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	2	14.053	7.027	1.234
Within groups	<u>135</u>	767.403	5.684	
Total	137			

Null Hypothesis: There is no significant difference between managerial perceptions of the impact of employee fatigue on successful implementation of a four-day workweek between firms which differ in the hours worked each day.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	1.234	3.07	NO

the highest mean response; those working "10 and over" had the lowest. This suggests that the firms tend to arrange their schedules according to their opinions of how fatigue will affect their employees.

The mixed reaction and failure to reject the null hypothesis indicates that fatigue is not a factor when longer days are worked. This supports the AMA results and appears to indicate that among firms with experience on the four-day workweek fatigue may depend upon factors other than the length of the work day. Testing the effect of the percentage of females employed on fatigue resulted in findings significant at the .10 level. This finding approached the required .05 level of significance. The direction indicated that fatigue did have an impact when female workers were considered. This result indicates additional study of the fatigue factor based on each of the other variables included in the current study should be considered.

Hypothesis 6: Improved job satisfaction of the workforce has a significant impact on the successful implementation of a four-day workweek -- Table 5.7 presents findings which show the impact of employee satisfaction on success in firms with permanent programs and those who have discontinued the four-day plan. The analysis of variance indicates that there is a highly significant relationship (at the .001 level) exhibited between the managerial perceptions of the impact of employee satisfaction on successful implementation of the four-day workweek in the groups tested. The strong nature of the relationship leads to rejection of the null hypothesis. Prior research also indicated that employee satisfaction was a significant factor in firms'

TABLE 5.7

Summary Data and Analysis of Variance of Data Testing the Impact of Employee Satisfaction on Success Between Firms with Permanent and Discontinued Four-Day Conversions.

	<u>Permanent Conversion</u>		<u>Discontinued Conversion</u>	
$\frac{n}{\bar{X}}$	89		12	
	6.79		4.33	
<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	63.637	63.637	16.508
Within groups	99	381.610	3.855	
Total	100	445.247		

Null Hypothesis: There is no significant difference between managerial perceptions of the impact of employee satisfaction on successful implementation of a four-day workweek between firms that consider the change permanent and those that discontinued the plan.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.001	16.508	1.59	YES

continuation and success of the conversion.⁷

The strength of the relationship is as hypothesized and in the expected direction. The extremely high mean (6.79 of a possible 8) suggests that this is a significant consideration in remaining on such a plan. When asked for attitudes on the "A" scale, the results were also statistically significant (at the .001 level).

These results support earlier hypothesis testing (see Hypothesis 3) which suggested the importance of employees in successful conversion.

Hypothesis 7: Scheduling difficulties have a significant impact on the successful implementation of a four-day workweek -- Table 5.8 indicates that no statistically significant difference (at the .05 level) exists in the impact on success of scheduling difficulties between firms operating on different numbers of shifts per day. The analysis of variance yields negligible support of the hypothesis. The direction, however, is as hypothesized; the mean of the "more than one shift" was higher than "one-shift" operations. This result suggests that firms with multiple shift operations saw scheduling as having an impact on success.

This result, however does not provide a final explanation of the impact scheduling exerts on implementation of a four-day workweek. The importance of this factor was presented in Chapter III, which indicated that some continuous process industries anticipated problems and therefore avoided the change. If this is the case, further testing is needed to verify the impact scheduling has had in more recent conversions.

TABLE 5.8

Summary Data and Analysis of Variance of Data Testing the Impact on Success of Scheduling Difficulties Between Firms Operating on Different Numbers of Shifts Per Day

	<u>One Shift Operation</u>		<u>More than One Shift</u>	
n	84		55	
\bar{X}	4.12		4.64	
Source	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	8.895	8.895	1.24
Within groups	<u>137</u>	<u>981.537</u>	7.164	
Total	138	990.432		

Null Hypothesis: There is no significant difference between managerial perceptions of the impact of scheduling on successful implementation of a four-day workweek between firms which currently work different numbers of shifts per day.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	1.24	3.92	NO

Hypothesis 8: The percentage of females employed in a firm will have a significant impact on the success of a four-day conversion--Table 5.9 shows the three groups representing the percentage of females employed by the responding firms. The results of the analysis of variance in testing hypothesis H_8 strongly suggest that there is no significant difference between managerial perceptions of the impact on success of different percentages of females employed. To test this hypothesis, "0-10%" and "10-20%" were considered low; "20-30%" and "30-40%" medium; and "40-50%" and "over 50%" high percentages of female employees in the work group affected. With an extremely low F-ratio (.456) for the groups tested, little support is provided for the hypothesis. The highest number of responses given on both the "A" and "B" scales were the extreme positions on the scale of "Strongly Disagree" and "No Impact on Success". These results indicate opposite direction from the hypothesis and suggest that the null hypothesis be accepted.

The difference between this finding and prior observations discussed in Chapter III indicate that prior efforts may have included firms commenting on the conversion without operating experience which could have distorted the results.

As indicated in the analysis of H_5 , the percentage of females employed was tested against fatigue in the attitudinal "A" scale and was significant at the .10 level; the result approached the required significance level (.05). This finding suggests a potential barrier to conversion resulting from a high percentage of female employees.

TABLE 5.9

Summary Data and Analysis of Variance of Data Testing the Impact of the Percentage of Females Employed on Success Among Firms with a High, Medium or Low Percentage Employed

	<u>High</u>	<u>Medium</u>	<u>Low</u>
$\frac{n}{\bar{X}}$	53 4.08	29 4.03	56 4.45

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	2	4.975	2.488	.456
Within groups	<u>135</u>	<u>736.503</u>	5.455	
Total	137	741.478		

Null Hypothesis: There is no significant difference between managerial perceptions of the impact of the percentage of females employed on successful implementation of a flexible workweek among firms with a high (over 40%), medium (20-40%), or low (0-20%) percentage of female employees

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	.456	3.07	NO

One problem in the current research could be that the percentage breakdown used was not adequate for differentiation. This could be one cause of the unexpected results. Whatever the cause, the confusion in the results indicates that firms with a high percentage of female employees should encourage further research concerning the impact of this factor on success.

Hypothesis 9: The size of the firm does not have a significant impact on successful conversion to a flexible workweek -- Previous research has indicated that the majority of firms converting to a four-day workweek have employed less than 130 persons. As noted earlier, preliminary results from the AMA study indicated that size had no apparent impact on success of operations. Table 5.10 indicates this view may be correct. It reports the finding relating the size of the work force to the impact on success. The result of the analysis of variance testing indicates that there is no significant difference (at the .05 level) in managerial perceptions of the impact of size on success. The low F-ratio of .642 indicates an extremely low level of significance.

The largest size category utilized (over 500 employees) resulted in the highest mean (5.85), which appeared to be sufficiently high to warrant further investigation. When groups "1-50" through "201-500" were combined, and compared with the "over 500" groups, the F-ratio increased to 1.92, indicating a higher level of significance. The size of the "over 500" group (13) appeared to be one reason the results failed to reach the required level. The means of the smaller and larger firms, 4.920 and 5.846 respectively, are in the expected direction.

TABLE 5.10

Summary Data and Analysis of Variance of Data Testing the Impact of the Size of a Firm on Success of Firms with Different Number of Employees Affected by the Conversion

	<u>Number of Employees</u>				
	<u>1-50</u>	<u>51-100</u>	<u>101-200</u>	<u>201-500</u>	<u>Over 500</u>
<u>n</u>	60	24	20	21	13
<u>X</u>	5.15	4.67	4.75	4.71	5.85

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	4	16.281	4.070	.642
Within groups	<u>133</u>	<u>842.711</u>	6.336	
Total	137	858.992		

Null Hypothesis: There is no significant difference between managerial perceptions of the impact of the size of the firm on successful implementation of a four-day workweek among firms which differ in size.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
7.05	.642	2.45	NO

The uncertainty of the findings leave some doubt as to the validity of accepting the null hypothesis. Because of the exploratory nature of this research, Hypothesis 9 is rejected based on the results of the testing, but further efforts are necessary to determine the full impact of the factor on implementation of the four-day work-week.

Hypothesis 10: The average age of the workforce has a significant impact on the successful implementation of a four-day workweek -- Table 5.11 provides the analysis of variance data required to test the impact of the average age of the workforce on success among firms with different average ages of employees affected by the conversion. To analyze the data, all categories were combined to form "under 35" and "over 35" age groups. The results of the hypothesis testing show that there is no statistically significant difference in the impact on success between the two groups tested. Prior research suggested that younger workers were more flexible in their attitudes toward change. Contrary evidence is indicated by the low F-ratio (.859) obtained in the current research. The hypothesis direction was supported, however, in that the mean of the "under 35" group (5.68) was larger than that of the "over 35" group (5.36). This partially supports the prior literature.

When the attitudinal "A" scale was considered, the result was overwhelmingly negative, with an F-ratio of .071 indicating virtually no significance. The findings here strongly indicate that age of the workforce is not a significant factor in success of the four-day work-week.

TABLE 5.11

Summary Data and Analysis of Variance of Data Testing the Impact of the Average Age of the Workforce on Success Among Firms Differing in Average Age of Employees Affected by a Conversion

	<u>Under 35</u>		<u>Over 35</u>	
$\frac{n}{\bar{X}}$	76		63	
	5.68		5.36	
<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	3.508	3.508	.859
Within groups	<u>137</u>	<u>559.124</u>	4.080	
Total	138	562.532		

Null Hypothesis: There is no significant difference between managerial perceptions of the impact of the age of workforce on successful implementation of a four-day workweek between firms whose average age of the workforce is under 35 and firms whose average age of the workforce is over 35.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	.859	3.92	NO

Hypothesis 11: Changes in the rate of absenteeism will have a significant impact on successful implementation of the four-day workweek -- Table 5.12 shows that the F-ratio (2.75) is not statistically significant (at the .05 level). The relationship between the impact on success of changes in the rate of absenteeism for firms with permanent and discontinued four-day conversions is supported at the .10 level on both the principal testing scale and the attitudinal "A" scale. Therefore, although the null hypothesis cannot be rejected, based on the .05 significance level, acceptance of the null seems to indicate the possibility of error. The difference in the means of the permanent and discontinued firms (6.19 and 5.17, respectively) is approaching significance and is in the direction anticipated. In fact, it is felt the higher means helped explain why a firm considered its conversion to be permanent.

Based on the previous research and the significance level of .10 reported here, more research should be done to consider actual changes in the rate of absenteeism within firms with experience on the four-day workweek.

Hypothesis 12: Changes in the turnover rate will have a significant impact on successful implementation of a four-day workweek -- Table 5.13 presents the result of the analysis of variance testing to determine the relationship between changes in the turnover rate and the experiences of firms with permanent and discontinued four-day conversions. The finding indicates that there is no significant difference in the impact on success of changes in turnover between these groups. The F-

TABLE 5.12

Summary Data and Analysis of Variance of Data Testing of the Impact of Success of Changes in The Rate of Absenteeism Between Firms with Permanent and Discontinued Four-Day Conversions

		<u>Permanent</u>	<u>Discontinued</u>	
	$\frac{n}{\bar{X}}$	89 6.19	12 5.17	
<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	11.095	11.095	2.75
Within groups	<u>99</u>	<u>399.419</u>	4.034	
Total	100	410.514		

Null Hypothesis: There is no significant difference between the managerial perceptions of the impact of changes in the rate of absenteeism on successful implementation of a four-day workweek between firms on a permanent four-day workweek and firms that discontinued the four-day plan.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	2.75	3.96	NO

TABLE 5.13

Summary Data and Analysis of Variance of Data Testing the Impact on Success of Changes in the Turnover Rate Between Firms with Permanent and Discontinued Four-day Conversions

		<u>Permanent</u>	<u>Discontinued</u>	
	$\frac{n}{\bar{X}}$	89 5.55	12 5.08	
<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	2.308	2.308	.400
Within groups	99	570.939	5.767	
Total	100	573.247		

Null Hypothesis: There is no significant difference between the managerial perceptions of the impact of changes in the turnover rate on successful implementation of a four-day workweek between firms on a permanent four-day workweek and firms that discontinued the four-day plan.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.05	.400	3.96	NO

ratio of .400 is low and suggests that changes in turnover were not a primary reason for firms to discontinue the conversion. The mean of firms working a four-day workweek (5.55) was higher than that of the firms which discontinued the programs (5.08). This indicated some impact in both cases. As will be seen in the discussion of hypothesis H_{13} differences in productivity seems to be the major factor influencing the decision to discontinue the plan. The result requires acceptance of the null hypothesis. The direction of the means indicates that the firms perceived an impact on success.

The small size of the "discontinued" group may have had an influence on the findings. Comparisons of actual changes in turnover rates may be needed to fully describe the existing relationship.

Hypothesis 13: Changes in productivity will have a significant impact on successful implementation of a four-day week -- Table 5.14 presents the findings from the analysis of variance testing of the impact on success of changes in productivity between firms with permanent and discontinued four-day conversions. The test results indicate that there is a significant difference (at the .001 level) between the managerial perceptions of the impact on success of productivity changes. The means for the permanent and discontinued four-day plans (5.70/3.0) indicate that the results are in the predicted direction. The comments and direction indicate productivity changes are a primary reason for the continuation of the four-day plan. The strength of the relationship is somewhat surprising and indicates that the prior research concerning productivity increases influencing success is supported. The results indicate that those firms which discontinued the four-day plan

TABLE 5.14

Summary Data and Analysis of Variance of Data Testing the Impact on Success of Changes in Productivity Between Firms with Permanent and Discontinued Four-Day Conversions

		<u>Permanent</u>	<u>Discontinued</u>	
	$\frac{n}{\bar{X}}$	89 5.70	12 3.0	
<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MSE</u>	<u>F</u>
Between groups	1	76.894	76.894	21.82
Within groups	<u>99</u>	<u>348.809</u>	3.523	
Total	100	425.703		

Null Hypothesis: There is no significant difference between the managerial perceptions of the impact of changes in productivity on successful implementation of a four-day workweek between firms on a permanent four-day workweek and firms that discontinued the four-day plan.

<u>Significance Level</u>	<u>Computed Value</u>	<u>Table Value</u>	<u>Reject Null Hypothesis</u>
.001	21.82	3.96	YES

did not experience the expected increases in productivity.

Previous results indicated the positive relationship of employee satisfaction to success. The results help explain the strength of the relationship between productivity changes and their impact on success. Testing of the attitudinal "A" scale revealed an even stronger relationship than the "B" scale. The reported F-ratio 27.89 from the "A" scale and the reasons for that finding appear to be similar to those of the "B" scale.

The highly significant result of the testing of the hypothesis requires rejection of the null hypothesis and acceptance of the original hypothesis that changes in productivity will have a significant impact on successful implementation of a four-day workweek.

Summary

The hypothesis testing resulted in acceptance of four hypotheses. Hypotheses H_2 , H_3 , H_6 , and H_{13} are significant at the .05 level. Hypothesis H_{11} is considered to be "approaching significance", (at .10 level). The results indicate support for the literature in each of the above hypotheses, and represent the first attempt at testing the proposed relationships. The data suggests that further testing is needed to confirm several of the areas under consideration. As an exploratory effort it is felt this study contributes to the knowledge base concerning the four-day workweek.

CHAPTER VI

DEVELOPMENT AND ANALYSIS OF EXPLORATORY EQUATIONS

James Dunlop suggested that no quantitative procedure currently exists to determine the probability of success in implementing a four-day workweek. "A trial and error period relating to each specific case" accompanied the development of current four-day plans.¹ The trial and error approach, however, is deemed unscientific and potentially hazardous to the firm considering a four-day workweek. The final results section, therefore, reports the data obtained from the initial exploratory attempt to quantitatively explain the relationships between each of the four dependent variables reported in this section and the 21 independent variables remaining from those discussed in Chapter III. The dependent variables are absenteeism, turnover, productivity, and employee satisfaction.

Each firm's responses to questions representing each of the 22 variables were obtained from the "B" scale and were used to measure the impact on success exerted by each respective variable.

¹Personal correspondence (March 30, 1973) from James D. Dunlop, Director, Industrial Relations, National Industrial Convention, Washington, D.C.

The above determination of the impact on success was used for the regression calculations.

Equations were developed through a stepwise regression analysis and the use of the Hocking-LaMotte-Leslie Optimum Regression Technique.² Both techniques were utilized to check the possibility of one technique distorting the results through statistical procedures which could produce spurious results. A cross-check of the two techniques indicated the correlation coefficients obtained in each method were identical to the fourth digit.

The development and analysis of the appropriate equations is based on the use of independent variables which were statistically significant at the .05 level or higher. This procedure reduces the potential of spurious correlation. To further reduce this possibility, the resulting direction of the relationship is considered to determine whether the reported relationships were reasonable.

Equation 1: D_V-Absenteeism

Hypothesis testing in the previous section supported the impact of absenteeism on success at the .10 level among those firms which considered their four-day conversion permanent and those discontinuing the plan. Although this level did not meet the .05 criterion, the results of the statistical analysis used to measure the relationships between absenteeism and the independent variables were approaching significance.

²L.R. LaMotte and R.R. Hocking, "Computational Efficiency in the Selection of Regression Variables, " Techometrics Vol. 12, No. 1, (February, 1970) p. 84.

Table 6.1 indicates that the implied null hypothesis that there is no correlation between the dependent variable absenteeism and the respective independent variables from the equation can be rejected since the variables cited in this table are significant at the .05 level. Therefore, the implied hypothesis, that there is a correlation, would be accepted. The reported F-ratio is significant at levels greater than .01, indicating an extremely strong relationship.

TABLE 6.1

Results of Stepwise Regression Technique to Develop Exploratory Equations for Dependent Variable-Absenteeism(A)

<u>Variable</u>	<u>Regression Coefficient</u>	<u>t-Value</u>	<u>F-Ratio</u>
Turnover (T)	.2548	3.7516	21.4252
Productivity (P)	.3023	3.8739	
Availability of Labor (AL)	.1688	2.2131	
<u>Multiple R</u>	<u>STD Error of Estimation</u>	<u>Intercept</u>	<u>R-Squared</u>
.567931	1.6773	2.0896	.3126
<u>Resultant Equation:</u> $Y_A = 2.0896 + .2548 X_T - .3023 X_P - .1688 X_{AL} + \text{Error}$			

Table 6.1 also shows that based on the R-Square calculation, the resultant equation accounts for 31.26 percent of the explained variance when three of the original 21 independent variables are considered. This suggests that in the exploratory stages of in-

investigating the potential success of a four-day conversion, consideration of the three components discovered in the regression analysis should give an indication of their potential impact on absenteeism.

The relationships between absenteeism and the three independent variables suggested by the resultant regression equation are discussed below. The analysis centers around the direction and strength of these relationships and minimized the possibility of spurious correlation.

The suggested relationship between absenteeism and turnover is in the anticipated direction. The positive relationship appears reasonable in that with higher rates of absenteeism, higher turnover could be expected based on dissatisfaction and related factors. The strength of the relationship suggests that the correlation is extremely strong.

Productivity increases were established earlier as a principal reason for continuation of the four-day plan. The strong relationship suggested by the earlier hypothesis testing (see Chapter V) is further supported in the resultant equation. Increased productivity would be based on reductions in the rate of absenteeism. This relationship is therefore, in the expected direction.

Improved availability of labor should result in hiring "better" employees. This improvement indicates that careful selection could result in eliminating employees with high potentials for dissatisfaction. The improved selection ratio should then result in reducing the rate of absenteeism as the coefficients indicate. The relationship is relatively strong (.025 level), and must be considered in the decision-making process.

The resultant equation reveals that turnover, productivity, and availability of labor do have a significant and determinable impact upon absenteeism. This equation is the first of the four developed in this section in order to provide a quantitative decision-making technique for firms considering conversion to a four-day work-week.

Equation 2: D_v -Turnover

Table 6.2 shows the results of the stepwise regression analysis between the dependent variable, turnover, and the independent variables.

The results indicate that the assumed null hypothesis of no correlation between turnover and the independent variables can be rejected since three are significant (at the .05 level). This leads to acceptance of the implied hypothesis that there is a statistically significant correlation between turnover and the three independent variables in Table 6.2. A strong relationship is indicated by the high F-ratio. The resultant equation accounts for 27.05 percent of the explained variance in the correlation through considering the three significant independent variables. Discussion of the correlations of each of the variables is considered to determine strength and direction of the relationships.

The reported correlation between absenteeism and turnover was discussed in the prior section concerning Equation 1. The same logic is applicable in that high absenteeism would indicate a potential for a high turnover rate.

TABLE 6.2

Results of Stepwise Regression Technique to Develop Exploratory Equations
for Dependent Variable-Turnover (T)

<u>Variable</u>	<u>Regression Coefficient</u>	<u>T-Value</u>	<u>F-Ratio</u>
Absenteeism (A)	.4150	4.3652	17.5953
Productivity (P)	.2536	2.6379	
Overtime Requirements (OR)	.1652	2.2626	
<u>Multiple R</u>	<u>STD Error of Estimation</u>	<u>Intercept</u>	<u>R-Squared</u>
.5302	2.0118	.8531	.2795

Resultant

Equation: $Y_T = .8531 + .4150 X_A - .2536 X_P - .1652 X_{OR} + \text{Error}$

The strength of the correlation is significant and shows the anticipated correlation. The positive direction is also as expected and supports the prior research (see Chapter II) concerning the results of companies adopting the four-day workweek.

Productivity was also discussed in Equation 1. The negative correlation between turnover and productivity is again strongly supported and in the expected direction.

The third independent variable considered is overtime requirements. Overtime requirements are defined as the necessity of paying overtime for all hours over eight hours. The correlation is significant at levels exceeding the .05 level. The direction is also as

expected. Analysis of this factor suggests that a reduction in turnover will result from the mandatory payment of overtime during the normal workweek. This result appears reasonable in that employees working "4-40" would now receive a 10 percent premium as well as an extra day off. These benefits should reduce turnover since people work fewer days and get paid more.

Consideration of the three variables, absenteeism, productivity and overtime requirements, as shown in the second equation, should therefore aid a manager in making his decision whether or not to adopt a four-day workweek.

Equation 3: D_v-Productivity

Table 6.3 presents the findings obtained from the stepwise regression analysis representing the relationship between productivity and the independent variables shown in the table.

TABLE 6.3

Results of Stepwise Regression Technique to Develop Exploratory Equations
for Dependent Variable-Productivity

<u>Variable</u>	<u>Regression Coefficient</u>	<u>t-Value</u>	<u>F-Ratio</u>
Absenteeism (A)	.3044	3.9306	19.1676
Satisfaction (S)	.2808	4.1427	
Prior Experience (PE)	.1819	2.5413	
Turnover (T)	.1566	2.3538	
<u>Multiple R</u>	<u>STD Error of Estimation</u>	<u>Intercept</u>	<u>R-Squared</u>
.6033	1.6158	-.1785	.3498

Resultant

Equation: $Y_p = -.1785 - .3044 X_A + .2808 X_S + .1819 X_{PE} - .1516 X_T + \text{Error}$

Four independent variables (absenteeism, satisfaction, prior experience and turnover) were significant at levels exceeding a .05 confidence level. This result led to rejection of the assumed null hypothesis that no correlation existed between the dependent and independent variables under consideration. The implied hypothesis that correlation exists was therefore accepted. The four variables account for 34.98 percent of the explained variance.

The reported relationship between productivity and both absenteeism and turnover has been discussed previously. The relationships are significant at levels exceeding the .05 level and in the anticipated directions. The remaining variables, satisfaction and prior experiences, are discussed below.

It was found that the highest t-value was obtained from the correlation between satisfaction and productivity. This correlation is highly significant (at the .001 level), and suggests that productivity will increase as satisfaction increases under the proposed four-day plan. Another factor which appears to be operating is that some increases in productivity are due to fewer start-up and shut-down times and could overstate the correlation slightly. Once again, one should be careful in considering the long-run impact of satisfaction and productivity in light of the "novelty effect" noted in the hypothesis testing previously discussed in Chapter V. The strength and direction are as expected, however, and support the earlier contention that both productivity and satisfaction have an impact on success of the four-day conversion.

The final factor to be discussed is that of "positive prior experiences with innovation." The high positive correlation (at the .01 level) was as anticipated. It was felt that past successes in introducing changes would smooth the way for introduction of the four-day workweek. Potential barriers existing in the organization would be known and dealt with; employees' needs would be considered, and the productivity of the organization would be considered. These factors would lead to fewer productivity problems in the introduction of a four-day workweek.

This third equation thus suggests that productivity will increase as turnover and absenteeism rates go down, and as satisfaction with the plan and the number of positive experiences with prior innovations increase.

Equation 4: D_v -Satisfaction

Table 6.4 presents the results of the stepwise regression analysis for the dependent variable, satisfaction, and the resulting independent variables shown in the table.

The resultant equation is significant (F-ratio of 14.78) and accounts for 23.62 percent of the explained variance. These results appear to be satisfactory and reduce the level of uncertainty concerning the relationship between satisfaction and the three independent variables, productivity, fatigue, and management support, currently existing in the literature. All variables were significant at the .05 level or higher, and the correlations were in the expected direction. The previous section considered the relationship between satisfaction and

TABLE 6.4

Results of Stepwise Regression Technique to Develop Exploratory Equations
for Dependent Variable-Satisfaction (S)

<u>Variable</u>	<u>Regression Coefficient</u>	<u>t-Value</u>	<u>F-Ratio</u>
Productivity (P)	.2799	3.5099	14.78
Fatigue (F)	.2278	3.4646	
Management Support (MS)	.2996	2.7776	
<u>Multiple R</u>	<u>STD Error of Estimation</u>	<u>Intercept</u>	<u>R-Squared</u>
.4973	1.8049	3.8072	.2362
<u>Resultant</u> <u>Equation:</u> $Y_S = 3.8072 + .2799 X_P + .2996 X_{MS} - .2278 X_F + \text{Error}$			

and productivity. As expected, productivity was one of the resultant independent variables and will not be discussed again.

Fatigue shows a negative correlation with satisfaction as expected. The t-value is highly significant. The analysis shows that as fatigue increases, satisfaction goes down. This result would appear to support portions of the literature cited in Chapter II.

The final variable, management support, was anticipated to be significant in considering both productivity and satisfaction, but such was only the case for the latter. The correlation is significant at the .01 level and in the anticipated direction. The greater the support of management for the change, the greater the satisfaction exhibited by the

workforce. This satisfaction could result from management consideration of the potential problems of conversion and increased attention to them. Also, if management support is high and enthusiastic, this attitude could be transferred to others in the organization.

The final resultant equation therefore, represents the positive correlations between satisfaction and both productivity and management support, plus the negative correlation between satisfaction and fatigue.

Summary

In view of the above analysis, a manager may now reduce his dependence upon the armchair method of decision-making regarding conversion to a four-day workweek. In accordance, he may utilize whichever of the following four equations is most applicable to his firm to improve his decision-making capabilities:

$$Y_A = 2.0896 + .2548 X_T - .3023 X_P - .1688 X_{AL} + \text{Error}$$

$$Y_T = .8531 + .4150 X_A - .2536 X_P - .1652 X_{OR} + \text{Error}$$

$$Y_P = -.1785 - .3044 X_A + .2808 X_S + .1819 X_{PI} + .1566 X_T + \text{Error}$$

$$Y_S = 3.8072 + .2799 X_P + .2996 X_{MS} - .2278 X_T + \text{Error}$$

As seen in these equations, productivity was the most frequently mentioned factor influencing the dependent variables. This result was expected based upon the AMA study which revealed that 62 percent of the responding firms reported productivity increases following conversion.³

In addition, turnover and absenteeism both appear twice in the

³AMA Report, op. cit. p. 4-5.

equations as conditions which can affect the impact on success of a four-day conversion.

Each of the remaining six variables which met the test for significance only appear in the equations once. Each of these does influence the results obtained through the utilization of these equations. In Equation 1, the availability of labor appeared to influence the dependent variable, absenteeism, through improvement in the selection ratio. In Equation 2, overtime requirements affected turnover in that they resulted in higher pay for fewer days worked. Equation 3 shows that both satisfaction and prior experience with successful innovations had an impact upon productivity. The relationship between satisfaction and productivity seems reasonable in light of the American Society for Personnel Administration and Bureau of National Affairs, Inc. results which showed that "seventy-nine percent of the firms were satisfied with the change" because of accomplishment of goals such as improved productivity. Positive prior experiences with innovations also appeared to have minimized the difficulties of introducing the change. The final factors to be discussed are fatigue and management support, which were shown to influence the dependent variable, satisfaction, in Equation 4. Results of prior research on the impact of fatigue on success of the four-day workweek (see Chapter II) were mixed. Equation 4 indicates that negative correlation exists between satisfaction and fatigue. Management support may enhance the early identification of potential problems and improve the overall acceptance of the plan. The above analysis indicates that quantitative techniques can be applied in an

area which had previously utilized only a "trial and error" approach.

The ultimate usefulness of the equations appears to depend on selection of one of them to avoid problems of identification of the significant variable. Any firm considering use of the equations must be prepared to measure the independent variables through available data or estimates if necessary. This may reduce the reliability, but could provide some decision-making guides.

The equations are highly exploratory and should be utilized only on this basis. The high degree of interdependence between the variables points out the necessity of attempts at measurement. While complicating the measurement this does not invalidate the results.

CHAPTER VII

SUMMARY AND CONCLUSIONS

The current research was an attempt to increase the understanding of factors influencing successful four-day conversions. To accomplish this three primary goals were set. The first goal was to develop a profile of firms with operating experience on a four-day workweek. Secondly, hypotheses pertaining to the factors which exerted an impact on the success of the plan were empirically tested. This had not been attempted in the previous literature. Finally, four regression equations were developed to determine which variables had a significant impact on four frequently mentioned areas of potential improvement. These factors were absenteeism, turnover, productivity, and employee satisfaction. No such attempt had previously been published.

Samuelson earlier suggested that the four-day workweek was a "momentous social invention." This research showed which factors managers perceived as critical to their firms' success or failure in implementing this innovation. One new direction in this research was the empirical testing of the perceptions of top management officials concerning the factors which had an impact upon the implementation of their chosen workweek arrangement. The development of profiles of firms operating on a flexible workweek, hypothesis testing, and the development of equations which considered the

quantitative impact of selected variables upon success factors of the conversion was completed to produce more tangible evidence of factors related to success.

Methodology.

Determination of the success-related variables considered in the research and the methodology employed stemmed from an extensive review of the literature. Previous research suggested 700 firms had at least one year of operational experience on a four-day workweek at the time of this research. This experience was not a criterion for previous research efforts. Four-hundred four-day firms were obtained for use as a selected sample. The rather exhaustive sample was sought to increase the possibility of adequate numbers of respondents in each category to describe the characteristics of the population under study.

Another significant difference in the current study and previous work was in the design of the questionnaire. Two eight-point interval scales were used to differentiate between simple agreement with the statement and the impact on success of the variable being considered. A cross-check of the data indicated that the differentiation was accomplished. This distinction was felt to be necessary to determine the impact on success of the variable as opposed to a respondent's simple agreement or disagreement with the statement. Previous research had not used such a procedure. It was felt this differentiation helped to increase the overall response rate (46 percent). The usable response rate for analytic purposes was 35 percent. The difference between these two rates was primarily due to respondents

completing only the attitudinal portion when they felt they had not experienced the impact being considered. This source of differentiation appeared to increase the validity of the impact measures. From this questionnaire the three techniques discussed previously were used to analyze the data.

Profile Characteristics:

Findings. Nine of the 20 selected characteristics had not been considered in prior research efforts. These characteristics included average percent of sales to government, skill requirements, availability of labor, changes in the total wage bill, percentage of persons moonlighting, number of area firms on a four-day plan, and the general economic outlook at the time of conversion.

Comparisons were made between the current research effort and at least one of the prior studies for the remaining 11 characteristics. These comparisons yielded no unreconcilable differences. In light of this fact, the information obtained through the reporting characteristics was further analyzed by hypothesis testing in Chapter V.

Implications for Management. Two positive results were obtained from the profile data. First, the comparison of the current research to prior research showed similar patterns. Where any differences did exist, they were explainable by sample selection and the time period involved in the study. This suggests to the manager that he has an accurate reading of what firms were converting and how many were continuing the conversion. This helps reduce some of the anxiety and misconceptions which result from a lack of verifiable information.

Secondly, nine new characteristics were investigated which

broadens the scope of answers available to managers. One example is the percentage of persons moonlighting. Sixty-seven percent of the firms reported less than five percent of the workforce was moonlighting. This should reduce some of the fears of dual job holding and increases in fatigue.

Future research should attempt to retest the new variables and indicate the industry directions of subsequent conversions.

Hypothesis Testing

Hypotheses were developed where sufficient support was determined to exist in the literature. Hypothesis development was limited to 13 of the 22 variables under consideration. The remaining variables were considered to be exploratory in nature and lacked sufficient empirical or theoretical base for hypothesis testing. Each of the hypotheses was tested to determine the impact on the successful implementation of a variation in hours of work exerted by the variable being considered. The 13 hypotheses developed in Chapter III are discussed on the basis of this significance. The significant hypotheses are discussed first, and those which did not prove statistically significant follow. Exhibit 7.1 presents a summary of the hypotheses which proved significant at the .05 level or higher. They are reviewed in a decreasing order of significance.

EXHIBIT 7.1

Significant Results of Hypothesis Testing			
	<u>Computed Value</u>	<u>Table Value</u>	<u>Significance Level</u>
H ₁₃	21.82	3.96	.001
H ₆	16.51	11.59	.001
H ₃	3.95	3.07	.025
H ₂	5.74	5.17	.025

Hypothesis 13: Changes in Productivity will have a significant impact on successful implementation of a four-day week

Findings. Previous literature suggested that the four-day work-week would exert a positive impact on productivity. A significance level of .001 was established between firms which considered the four-day conversion permanent and those which had discontinued the plan. Northrup was one dissenter from this view. The current research should satisfy his idea that a positive impact on productivity was not adequately proven.

Implications for management. This success combined with the low failure rate (nine percent) cited in the current research indicated that a significant number of firms experienced a positive impact on productivity, and this result was a primary reason for the permanent adoption of the four-day workweek. Productivity also proved to be the most frequently cited variable in the development of the exploratory equations reported in Chapter VI. Managers should take note of this finding in assessing ways to improve productivity. In the manufacturing sector, which comprised the largest group reported, fewer start-up times was one reason cited for this improvement. Another factor influencing this change was improved employee satisfaction. One note of caution is the emergence of a "novelty" effect in the testing. Another factor to consider would be whether a firm reduced its efforts to develop technological change or job design in favor of a four-day conversion. Conversion would not appear to be an either/or situation, but only one step in pursuing improvement.

Hypothesis 6: Improved job satisfaction of the workforce has a

significant impact on the successful implementation of a four-day workweek.

Findings. The literature indicated that job satisfaction increased upon conversion to a four-day workweek. The test results were highly significant (at the .001 level) and were in the expected direction. The extremely high significance level and mean response indicated that satisfaction is a critical factor regarding permanency of the conversion.

Implications for Management. This research shows that problems of productivity and morale may be partially eliminated by the conversion. The purpose of the hypothesis testing in the current research was to consider the impact of this hypothesized satisfaction on success between firms which considered the change permanent and those which discontinued the plan. It was anticipated that firms which discontinued the plan had not experienced the expected increases in job satisfaction and the consequent changes in productivity and morale. Since prior research has shown that satisfied employees are not necessarily productive employees, an additional purpose of the hypothesis testing was, therefore, to investigate the effect of satisfaction on success.

The effect on success was as predicted and was also one of the most significant factors mentioned in the equation development. Managers, particularly in labor-intensive firms, should consider this result very carefully.

Future research which would be of interest to managers should develop profiles for types of employees who are satisfied with the

conversion. Demographics should be used to stratify and develop testing procedures to accomplish this goal.

Hypothesis 3: Labor-intensive industries will have less difficulty converting to a four-day workweek than capital-intensive firms

Findings. Despite the limited prior evidence concerning this subject, it has been noted that the gains from conversion are often "people-oriented", and therefore, gains should accrue to the labor-intensive firm. A primary impetus for these gains has been improved employee morale. Hypothesis testing resulted in a significance level of .025 and suggested that the labor-intensive nature of the firm will have a strong effect upon the successful implementation of the four-day workweek.

Implications for Management. This finding may be due to the indivisibility of capital equipment. People, on the other hand, possess the potential to improve their attitudes and, therefore, productivity; machines possess no such corresponding ability. Labor-intensiveness affects both difficulty of the conversion and managerial predispositions toward the four-day concept. One factor which could increase the difficulty of conversion for the labor-intensive firms would be the "novelty" effect discussed in Hypothesis 2. Thus, despite the results which strongly support Hypothesis 3, further testing should be undertaken in order to clarify this effect.

Future testing of the employee satisfaction levels discussed in the prior section should help in this area. Also, break-downs of specific ranges of labor-intensiveness could clarify the satisfaction

versus novelty question. Further research on the timing and prior planning in labor-intensive firms would also be relevant.

Hypothesis 2: A "novelty" effect will have an impact on the success of conversion to a four-day workweek

Findings. Hypothesis testing indicated the existence of a "novelty" effect operating upon conversion to a four-day workweek. A significance level of .025 suggested that the impact of the "novelty" effect was a significant factor in firms' decisions to discontinue the plan.

Implications for Management. Hedges suggested productivity increases resulting from conversion to a four-day workweek could be eliminated if improved morale diminished. Comments from some responding firms indicated that they experienced such declines. In light of these results, firms considering conversion must be aware of a potential loss in productivity gains after conversion. They might, therefore, utilize the four-day conversion as a change agent to pave the way for future innovations. This change agent role was not specifically studied in this research. Further efforts should be aimed at developing follow-up studies of operating firms to determine other changes in their work procedures and policies.

Each of the hypotheses discussed in this section proved to be significant at levels of .025 and higher. This provides strong support for the hypotheses as stated. All of the four were also significant at the .05 level or higher on the attitudinal "A" scale considered for supportive purposes in the research. This suggests that managers in

firms with experience on the four-day workweek agree with the concepts presented and also perceived an impact on their success due to these variables.

Non-Significant Hypotheses

The following discussion is based on the hypotheses which did not meet the required .05 level of significance. These are discussed in a decreasing order of significance. Exhibit 7.2 shows that Hypothesis 11 was significant at the .10 level and was the only variable considered to be "approaching" significance.

EXHIBIT 7.2

Insignificant Results of Hypothesis Testing

	<u>Computed Value</u>	<u>Table Value</u>	<u>Significance Level</u>
H ₁₁	2.75	3.96	.10
H ₁	1.71	3.92	.75
H ₅	1.23	3.07	.75
H ₇	1.24	3.92	.75
H ₁₀	.859	3.92	.75
H ₉	.642	2.45	.50
H ₄	.638	3.07	.50
H ₈	.456	3.07	.50
H ₁₂	.400	3.96	.50

Hypothesis 11: Changes in the rate of absenteeism will have a significant impact on successful implementation of the four-day workweek

Findings. Prior literature indicated that reduced absenteeism was

one of the benefits of the four-day conversion. The current research supported the hypothesis on both the principal impact scale and the attitudinal scale at the .10 level. This result did not meet the .05 requirement for rejection of the null hypothesis but can be considered 'approaching significance.' The size of the means of the respective test groups (6.19 and 5.17) supported the prior contentions. The combination of the .10 significance level and the high means suggests a possible existence of an impact of absenteeism on success.

Implications for Management. Difficulties may have been due to the time spans involved. Some firms may not have seen the reduction in absenteeism due to a lack of a comparative base period. Managers should consider the increased reduction in pay which results from missing one day of four versus one of five. This was one reason cited for the decline in absenteeism in previous research. The improved employee satisfaction cited previously is also a factor influencing success of the conversion.

Future research needs to compare actual changes in absenteeism rates to determine the full impact of a four-day conversion.

Hypothesis 1: The presence of a labor union will have a significant impact on successful implementation of a four-day workweek

Findings. Numerous statements of union opposition to the four-day workweek led to the development of this hypothesis. Despite the abundance of negative opinions in this area, the results of the hypothesis testing did not support the contention that the presence of a labor union will have a significant impact upon successful imple-

mentation of a four-day workweek.

Implications for Management. The attitudinal response showed respondents who indicated that they felt the presence of a union would make a difference in the implementation of a four-day workweek. This result was as anticipated, based upon prior research. The difference in results is significant because only a small number of firms in the sample were unionized. This result suggests that a manager should possibly consider the labor union in his decision-making process.

Future research attempts need to investigate unionized firms reactions to the conversion moves. The union leadership should also be studied to determine their objective.

Hypothesis 5: Fatigue is not a limiting factor on success of a firm's conversion to a four-day workweek

Findings. Hypothesis testing was utilized for Hypothesis 5 in an attempt to resolve existing differences of opinion in the literature. No significant difference (at the .05 level) was found between the impact of fatigue on success and the hours worked per day. These results supported the findings of the AMA report cited in Chapter II.

Implications for Management. Comments suggested that the type and nature of the work, rather than the hours worked per day may have caused any fatigue that was experienced.

The striking difference in test results and the literature indicates that opinions and impacts may be different. The AMA study

which showed the difference between five-day and four-day firms is another indication of support for the test results. If further testing supports the idea that fatigue does not have a significant impact on success, current legislative programs may need to be revised. One reason for this result may be a reduction in the physical exertion required in the semi-skilled and skilled job positions which comprise the majority of the employees affected by conversions. This finding appears to be significant for decision-making purposes.

Future research should consider job categories, the age of the worker, skill levels, and sex of workers to determine if any difference exists in fatigue levels within these groups.

Hypothesis 7: Scheduling difficulties have a significant impact on the successful implementation of a four-day workweek

Findings. A diversity of opinion concerning scheduling led to the development of Hypothesis 7. The mean response of those firms working more than one shift (4.64) exceeded the mean of those firms with single shift operations (4.12). This difference was only negligible in its support of the hypothesis, and the actual means were not as extreme as expected. Based upon the testing in this research, one must conclude that there is no significant difference between managerial perceptions of the impact of scheduling on successful implementation of a four-day workweek between firms which currently work different numbers of shifts per day.

Implications for Management. The AMA research study indicated that two and three-shift operations may be potential candidates for conversion to a four-day plan. The current research suggests support of this view.

This finding is significant because it is the first hard evidence indicating that multiple shift operations are not always negatively affected by conversion to a four-day plan.

Future research should not only consider the number of shifts, but the type of industry, the availability of labor, and the union status of the firm. This should be done to avoid potential errors in projections concerning conversion difficulties.

Hypothesis 10: The average age of the workforce has a significant impact on the successful implementation of a four-day workweek

Findings. Sources cited in Chapter III supported the contention that younger workers were more satisfied with their jobs after conversion and possessed a greater willingness to experiment with work hours. The low F-ratio (.859) resulting from the hypothesis testing provided evidence contrary to the above contentions. The direction of the hypothesis was supported, however, with the "under 35" category reporting the highest mean response. This result was the only indication of support for the hypothesis. Further testing based on the attitudinal scale indicated that virtually no relationship existed. Such minimal support of the original hypothesis forced acceptance of the null hypothesis indicating that age of the workforce is not a significant factor in success of the four-day workweek. Despite the lack of any significant difference between the means of the two test groups, however, the moderately high means (5.68 and 5.36) indicated directional support over both test groups.

Implications for Management. The results do not provide simple

answers for management. Young workers may or may not adapt to the conversion.

Future research should consider specific factors relating to satisfaction within each age category suggested in the current research effort.

Hypothesis 9: The size of the firm does not have a significant impact on successful conversion to a flexible workweek

Findings. Hypothesis 9 was primarily based upon the preliminary results from the AMA research report which indicated that size had no apparent impact on success of the four-day operations. Contrary evidence from the ASPA-BNA survey indicated the necessity for the testing of the AMA contentions. The results of the analysis of variance testing indicated that there was no significant difference (at the .05 level) in managerial perceptions of the impact of size on success. The low F-ratio of .642 indicated an extremely low relationship. These results appear to be suspect however, based upon the relatively high mean response (5.85 out of 8.00) from those firms employing over 500 persons. This response indicated that larger firms perceived an impact on the success of their conversion due to their size.

Implications for Management. The F-ratio does not support size as a factor which could influence success of a conversion attempt. The direction of the means for the "over 500" group, however, suggests size may be a factor. While this is not statistically significant, it appears that the small number of respondents in this group would be responsible for a portion of the results. This researcher would hes-

itate to accept the result of testing this hypothesis without further research.

Further research should consider factors such as scheduling difficulties, employee satisfaction, and the potentials for improvements in productivity measures.

Hypothesis 4: A firm's availability of labor will be increased upon conversion to a four-day workweek.

Findings. Prior research concerning improvements in the selection ratio had indicated that the selection ratio was improved, and firms were able to hire better qualified and skilled employees following conversion. Testing of Hypothesis 4 resulted in an extremely low F-ratio (.638), indicating that there was no significant impact on success as a result of changes in the availability of labor.

The only support for the hypothesis appeared to be that firms reporting plentiful supplies of labor had the highest mean response (5.88) of the three groups tested on the impact on success scale.

Implications for Management. An improved selection ratio was significant in the regression equations in relation to reducing the rate of absenteeism. This implies some impact.

The difference suggests additional follow-up studies would be desirable. A clear picture of whether the firm should expect a higher selection ratio could be an important factor in the consideration of conversions.

Hypothesis 8: The percentage of females employed in a firm will have a significant impact on the success of a four-day conversion

Findings. Reports concerning the difficulties with the four-day workweek encountered by female employees were rather extensive and ranged from opposition to the ten-hour day to problems related to social activities. Hypothesis testing in the current research showed virtually no support for the above hypothesis. Responses to the attitudinal scale, however, did yield results which were significant at the .05 level, indicating that although no impact was currently being felt, firms did anticipate an impact. However, the anticipated impact appeared to be partially due to general attitudes toward female employees rather than difficulties due to the four-day conversion.

The highest number of responses given on both the attitudinal and impact scales were in the most extreme positions on the scale of "Strongly Disagree" and "No Impact on Success." This response pattern, combined with the extremely low F-ratio (.456), required the acceptance of the null hypothesis.

Implications for Management. The obvious interpretation is that there is no significant difference between female and male employees in terms of a four-day conversion. This could be an indication of another "myth" surrounding the female employee. The extreme positions suggest female employees adapt as well as male employees.

Future research concerning female employees should concentrate on marital status, age differences, number and age of children, the husband's work schedule, and fatigue to fully determine the impact a

high percentage of female employees would exert on success.

Hypothesis 12: Changes in the turnover rate will have a significant impact on successful implementation of a four-day workweek

Findings. Preliminary research conducted through Poor's original study and the AMA research report both indicated that decreased employee turnover could be expected upon conversion to a four-day workweek. When this finding was tested to determine the impact of changes in the turnover rate on successful implementation, the result was that no significant difference was found between firms with permanent and discontinued four-day conversions. The low F-ratio of .400 suggested that changes in turnover were not a significant factor in the determination of success in the above conversions. The only positive indication that the anticipated changes in turnover rate had a measurable impact on success arose from the direction of the mean responses of the questionnaire which resulted in means of 5.55 and 5.08, respectively for the permanent and discontinued four-day plans.

Implications for Management. Despite the required acceptance of the null hypothesis, the small size of the "discontinued" group may have had an influence on the findings. Extreme positions appear to have been partially minimized by the wide range of responses to the questionnaire and further pointed up the diversity of the sample of the firms tested.

The regression equations show turnover to be a factor which exerts an influence on success. The possibility of an improved selection ratio also suggests turnover may decline. The significance of changes in

employee satisfaction also should be considered. The testing of the permanent and discontinued conversions may have been inadequate to examine the proposed result.

Future research should consider actual changes in the turnover rate to establish the relationship between turnover and conversion to a four-day plan.

Equation Development

In order to provide practical application of the current research, four equations were developed in Chapter VI. These equations represented an initial exploratory attempt to explain the quantitative relationships existing between each of the four dependent variables (absenteeism, turnover, productivity, and employee satisfaction) and the independent variables discussed in Chapter III.

Findings. The final equations resulted from the use of the stepwise regression analysis and included those variables which were found significant at the .05 level or higher.

For each of the dependent variables, the existence of at least three independent variables which did meet the significance criteria indicated that changes in the independent variables did have an impact on each of the respective dependent variables. The resultant equations were:

$$Y_A = 2.0896 + .2548 X_T - .3023 X_P - .1688 X_{AL} + \text{Error}$$

$$Y_T = .8531 + .4150 X_A - .2536 X_P - .1652 X_{OR} + \text{Error}$$

$$Y_P = -.1785 - .3044 X_A + .2808 X_S + .1819 X_{PE} - .1566 X_T + \text{Error}$$

$$Y_S = 3.8072 + .2799 X_P + .2996 X_{MS} - .2278 X_F + \text{Error}$$

The analysis of Equation 1 is used as a means of explaining what each of the equations means to the individual manager in deciding what the total impact of the respective independent variables will be upon the dependent variable under consideration.

Equation 1 showed that the rate of change of absenteeism per unit change in turnover was .2548; for productivity, .3023, and for availability of labor, .1688. These regression coefficients, combined with the manager's perceptions of the potentials for change in each of the independent variables, yield the resultant change in absenteeism due to these independent variables. An example of the calculation of the percentage change in absenteeism, based upon the results from Equation 1, shows how a manager could utilize the four equations for decision-making purposes. The perceived potentials for improvement in each of the independent variables would be based upon information such as that developed in the profile characteristics (see Chapter IV) and hypothesis testing (see Chapter V). The manager's consideration of this information might lead him to expect turnover to decline by 10 percent, a 15 percent improvement in productivity, and a 10 percent improvement in the availability of labor. He would then calculate the consequent reduction in the rate of absenteeism to be:

$$\begin{aligned} &-.2548 (.10) + .3023 (.15) + .1688 (.10) \\ &+2.55\% - 4.53\% - 1.69\% \\ &=3.67\% \end{aligned}$$

The manager should utilize this result to determine potential cost savings and other benefits related to reduced absenteeism which resulted from conversion to a four-day workweek.

Implications for Management. A manager can employ this procedure to forecast improvements relating to each of the other three dependent variables. On the other hand, if the firm had experienced recognizable problems in a particular area represented by one of the dependent variables, the firm should first consider the corresponding equation to determine the potential improvement related to the problem area.

One must recognize that the predictive capacity of the equations is based upon estimations of perceived changes in each of the independent variables. Accordingly, the applicability of these equations is limited to those firms possessing at least minimal forecasting capabilities. Another limitation in utilizing the equations is that actual changes concerning each of the variables due to conversion were not discernible from the test data. Changes in the ranges wherein each variable fell were obtained; this procedure, however, provided inadequate differentiation between respondents' four-day workweek experiences due to the size of the ranges.

The equations must be used as independent units due to the high degree of interdependence exhibited in the four resultant equations. Managers should use the equations to determine the impact and resulting savings or costs due to conversion. The explained variance appears to be more significant than other alternatives and suggests that the equations can be used as preliminary tools for analysis.

Future research should focus on new measures of success and changes in the variables under consideration. The current research was highly exploratory and does not indicate the full scope of changes which could occur.

General Implications and Conclusions

Extensions of the current research should be combined with extensive attitudinal work to clarify individuals' perceptions of the social and economic impacts which the four-day workweek has had upon traditional work/leisure patterns. Specifically, more extensive research needs to be undertaken regarding the impact of labor organizations, the percentage of women employed, and persons of varying skill classifications. Recognition of the high percentage of manufacturing respondents should be considered. Such research is necessary to increase the potentials for successful conversion attempts.

Managers' positive perceptions of the four-day workweek, within firms currently operating under such a plan, strongly indicate that alternative work schedules such as the "4-40" plan are viable alternatives to the traditional five-day workweek. Such alternatives can minimize the specific problem areas discussed in the equation development. As more managers consider the four-day workweek and foresee the improvement in problem areas, more extensive adoptions should result. Alleviation of misconceptions and fears (of fatigue) will result from more extensive research efforts, and therefore, more deviations from traditional work schedules may be anticipated. This experimentation appears to be the "momentous" aspect of the four-day workweek. The final factor contributing to the increasing number of firms either adopting or considering alternative workweeks is employee satisfaction with the conversion. An increasing desire for greater numbers of days away from the workplace could result in a significant social impact and changes in consumption patterns. The short-term economic potential appears to be

positive in terms of productivity. Long-term prospects, however, are not as identifiable, based upon the possibility of a "novelty" effect which could reduce the initial gains in productivity. Despite such a "novelty" effect, the net result appears to be extremely positive regarding the future potential of experimentation with alternative work schedules.

The current research supports the above contention and demonstrates the diverse nature of firms operating on a four-day workweek (see Chapter IV). Hypothesis testing in the current research appears to have reduced some of the misconceptions discussed earlier. The results should increase the potential number of firms which will consider adoption of the four-day workweek due to the availability of "hard" data. Furthermore, the development of the equations in Chapter VI provides a quantitative technique with which to forecast their possibilities for improvement in problem areas relating to successful conversion attempts.

The combination of hypothesis testing and development of the regression equations had not been attempted at the outset of this research. This unique aspect of the research provides a firm base for future study of four-day conversions. Further isolation of variables such as the "novelty" factor, productivity, job satisfaction, and labor-intensiveness is recommended to improve our understanding of the topics. For example, productivity, could be tested against a number of variables to determine which have a significant impact on success. The increasing number of firms converting to four-day schedules requires follow-up testing to verify the results of this research. A new area of re-

search to be considered is the idea that conversion may act as a change agent for other innovations.

Use of the three types of information developed in this research justifies a stated goal, to increase the level of knowledge concerning alternative workweeks by providing information related to managers' perceptions of those factors which had a significant impact on the success or failure of four-day conversions.

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BRADLEY UNIVERSITY

PEORIA, ILLINOIS 61606

DEPARTMENT OF BUSINESS
MANAGEMENT AND ADMINISTRATION

April 27, 1973

Dear Sir:

The foresight of innovative managers is critical to the survival and profitability of every business firm. Your firm has indicated it possesses this characteristic by its consideration of a flexible workweek. It is to assist companies working to institute this type of program that this research project is being conducted. This project is designed to determine which factors determine successful conversion to a flexible workweek. Additionally, the results of this report are to serve as the foundation for my dissertation, a requirement for the Doctorate of Philosophy degree in Business Administration at Louisiana State University.

You are being requested to provide information for this study because you have shown your desire to lead the way in organizational experimentation. It is only through practicing managers like yourself that I can obtain the data necessary for this research. I hope you will help me in this study by providing the requested information. I feel that the effectiveness of innovation is most important to the continued success of every business firm.

Please be assured that the data you furnish will be treated confidentially. It is not necessary to place your name on the questionnaire. Additionally, the data will be combined and analyzed in such a manner that neither individuals nor specific firms will be identifiable from the completed dissertation. In addition to providing the information requested, please feel free to add any comments which you feel are pertinent on the back of the questionnaire.

After you have completed the questionnaire, please return it in the envelope provided. If you would like a synopsis of the results of this study, please request it under separate cover.

Thank you for your time and effort in making this study possible. I feel with a significant return ratio, critical factors underlying the successful implementation of a flexible workweek will emerge. I am looking forward to receiving your reply.

Sincerely yours,



K. Mark Weaver
Assistant Professor
Business Management & Administration

KMW

This project is designed to determine which factors determine successful conversion to a flexible workweek. In order to accomplish this purpose a two-part questionnaire will be utilized. Part I is designed to develop a profile of the firms which have attempted a conversion to a flexible workweek. Part II serves the dual purpose of first, obtaining your attitude toward statements concerning a flexible workweek, and secondly of determining the impact of the variable represented by the statements on success or failure of the conversion in your firm.

PART I

Please respond to the following questions as accurately as possible. These questions are designed to compile profiles of firms which have had both positive and negative experience with a flexible workweek.

1. Adoption date of the flexible workweek in your organization:
☐ Pre-1970 ☐ 1970 ☐ 1971 ☐ 1972
2. Status of the conversion:
☐ Permanent ☐ Experimental ☐ Discontinued
3. Number of persons employed by your firm:
☐ 1-50 ☐ 51-100 ☐ 101-200 ☐ 201-500 ☐ 501-1000 ☐ Over 1000
4. Number of persons affected by the new schedule:
☐ 1-50 ☐ 51-100 ☐ 101-200 ☐ 201-500 ☐ 501-1000 ☐ Over 1000
5. Type of Industry (Primary Classification):
☐ Manufacturing ☐ Retail ☐ Service ☐ Public ☐ Other
6. Union status of the participants in the changed workweek:
☐ Unionized ☐ Non-Unionized
7. Is your firm considered to be primarily
☐ Labor Intensive ☐ Capital Intensive
8. Geographic location:
☐ Northeast ☐ Northwest ☐ Southeast ☐ Southwest ☐ Midwest
9. Average percentage of sales due to government contracts:
☐ 0-10% ☐ 10-20% ☐ 20-30% ☐ 30-40% ☐ 40-50% ☐ Over 50%
10. Percentage of female employees in the work group affected:
☐ 0-10% ☐ 10-20% ☐ 20-30% ☐ 30-40% ☐ 40-50% ☐ Over 50%
11. Average age of employees in the work group affected:
☐ 18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ Over 55
12. Average skill requirements of the employees in the work group affected:
☐ Unskilled ☐ Semi-Skilled ☐ Skilled ☐ Professional/Technical
13. Availability of labor in your metropolitan area prior to the conversion:
☐ Plentiful ☐ Scarce ☐ Adequate
14. Changes in the total wage bill since the conversion:
☐ Increased Significantly ☐ Increased Slightly ☐ No Change
☐ Decreased Slightly ☐ Decreased Significantly

15. Number of shifts currently worked by employees affected by the conversion:

___ One Shift ___ Two Shifts ___ Three Shifts ___ Four Shifts

16. Length of the workday for employees affected by the conversion:

___ 8 Hours ___ 8½ Hours ___ 9 Hours ___ 9½ Hours ___ 10 Hours ___ Over 10

17. Percentage of persons "moonlighting" among those persons affected by the conversion:

___ 0-5% ___ 6-10% ___ 11-15% ___ 16-20% ___ Over 20%

18. Number of other firms on a flexible workweek in your metropolitan area:

___ 0-5 ___ 6-10 ___ 11-15 ___ Over 15

19. General economic outlook of your firm at the time of conversion:

___ Excellent ___ Good ___ Fair ___ Poor

20. Overall management satisfaction with the workweek conversion:

___ Satisfied ___ Not Satisfied ___ Too Soon To Tell

21. Productivity (Percentage of plant capacity utilized.):

<u>Range</u>	<u>Prior to Conversion</u>	<u>Since Conversion</u>
85-100%	_____	_____
70-84%	_____	_____
55-69%	_____	_____
Below 55%	_____	_____

22. Rate of Absentecism:

<u>Range</u>	<u>Prior to Conversion</u>	<u>Since Conversion</u>
0-2%	_____	_____
2-4%	_____	_____
4-6%	_____	_____
6-8%	_____	_____
8-10%	_____	_____
Over 10%	_____	_____

23. Annual Personnel Turnover:

<u>Range</u>	<u>Prior to Conversion</u>	<u>Since Conversion</u>
0-5%	_____	_____
5-10%	_____	_____
10-15%	_____	_____
20-25%	_____	_____
Over 25%	_____	_____

24. Overtime Rate: (overtime hours/total hours worked):

<u>Range</u>	<u>Prior to Conversion</u>	<u>Since Conversion</u>
0-5%	_____	_____
5-10%	_____	_____
10-15%	_____	_____
Over 15%	_____	_____

PART II

The following statements concerning a flexible workweek have been made by both supporters and opponents of this approach. Two measurement scales are provided under each statement for your responses. The first scale is designed to measure your attitudes as a practicing manager towards the idea expressed in the statement. Please respond to this statement by marking an 'X' in the space which best represents your attitude toward the idea expressed. The second scale is designed to determine the extent to which the variable represented by the statement affected your success or failure in converting to the flexible workweek. For this scale mark an 'X' in the space which best represents your firm's experience with a flexible workweek conversion.

1. Successful conversion of the company to a flexible workweek is dependent upon the commitment of top management to the change.

Strongly _____ Agree	Strongly _____ Disagree
Significant _____ Impact On	No Impact _____ On Success
Success	

2. Positive experience with past changes and innovations improves the capacity of employees to adjust to a flexible workweek.

Strongly _____ Agree	Strongly _____ Disagree
Significant _____ Impact On	No Impact _____ On Success
Success	

3. Positive results may be shortlived as the novelty of the system begins to pale.

Strongly _____ Agree	Strongly _____ Disagree
Significant _____ Impact On	No Impact _____ On Success
Success	

4. Job dissatisfaction prior to conversion to a flexible workweek is correlated with current employee preference for the new system.

Strongly _____ Agree	Strongly _____ Disagree
Significant _____ Impact On	No Impact _____ On Success
Success	

5. A flexible workweek reduces job commitment because employees are more concerned with leisure than their jobs.

Strongly _____ Agree	Strongly _____ Disagree
Significant _____ Impact On	No Impact _____ On Success
Success	

6. Large firms will have more difficulty in converting to a flexible workweek than smaller firms.

Strongly _____ Agree	Strongly _____ Disagree
Significant _____ Impact On	No Impact _____ On Success
Success	

7. The presence of a union will not make much difference in the implementation of a flexible workweek.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

8. Labor intensive industries are more likely to be successful with a flexible workweek than are capital intensive industries.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

9. Conversion to a flexible workweek is more difficult for firms with a high percentage of female employees.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

10. A younger workforce produces a greater willingness to experiment with work hours.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

11. The higher the skill level of the workforce, the greater the acceptance of a flexible workweek.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

12. A flexible workweek conversion increases the availability of labor to the firm.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

13. Employee fatigue is increased if a longer workday is required.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

14. The shorter workweek reduces absenteeism.

Strongly _____ Strongly
Agree _____ Disagree

Significant _____ No Impact
Impact On _____ On Success
Success

15. The necessity of overtime payments limits success of a flexible workweek.

- a. Strongly _____ Strongly
Agree _____ Disagree
- b. Significant _____ No Impact
Impact On _____ On Success
Success

16. Greater opportunities to spend money increases the demand for higher wages by employees.

- Strongly _____ Strongly
Agree _____ Disagree
- Significant _____ No Impact
Impact On _____ On Success
Success

17. Lower turnover rates are a positive result of conversion to a flexible workweek.

- Strongly _____ Strongly
Agree _____ Disagree
- Significant _____ No Impact
Impact On _____ On Success
Success

18. Conversion to a flexible workweek results in increased productivity.

- Strongly _____ Strongly
Agree _____ Disagree
- Significant _____ No Impact
Impact On _____ On Success
Success

19. Increased complexity of the managers job, due to the conversion to a flexible workweek, may limit its applicability.

- Strongly _____ Strongly
Agree _____ Disagree
- Significant _____ No Impact
Impact On _____ On Success
Success

20. Scheduling difficulty is a major disadvantage of converting to a flexible workweek.

- Strongly _____ Strongly
Agree _____ Disagree
- Significant _____ No Impact
Impact On _____ On Success
Success

21. Prior planning is a key to successful conversion to the flexible workweek.

- Strongly _____ Strongly
Agree _____ Disagree
- Significant _____ No Impact
Impact On _____ On Success
Success

22. Employee satisfaction with the change is the principle reason for continuation of the program.

- Strongly _____ Strongly
Agree _____ Disagree
- Significant _____ No Impact
Impact On _____ On Success
Success

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PEORIA, ILLINOIS 61606

DEPARTMENT OF BUSINESS
MANAGEMENT AND ADMINISTRATION

Dear Sir:

On April 30, I mailed you a questionnaire designed to gather information on your firm's experience with the flexible workweek. Your firm is one of my selected sample and your response is extremely important to the success of my study.

If you have not found the time to respond to the questionnaire, a few moments of your time to complete it will be of great value to the completion of my Doctoral Dissertation. If you have already responded, thank you for your cooperation.

I appreciate your time and assistance in this research effort.

Sincerely,

K. Mark Weaver
Assistant Professor

VITA

The author, Kenneth Mark Weaver, was born in Nashville, Tennessee on April 13, 1945. Primary education was in Plattsmouth, Nebraska at Central Elementary School. In 1957, he moved to Houma, Louisiana where he attended Houma Junior High School and Terrebonne High School until graduation in 1963.

Advanced education was at Louisiana State University. A Bachelor of Science degree was granted in January, 1968. Continuation of these studies led to entrance to the Doctoral programs at Louisiana State University. Both research and teaching assistantships were held at the University.

In August of 1972, a full-time teaching position was accepted at Bradley University in Peoria, Illinois and is currently held at that University.

The dissertation has been submitted for the degree of Doctor of Philosophy in Business Administration.